



# LIBRARY.



Class N 353.9

Number A 110

Volume 4

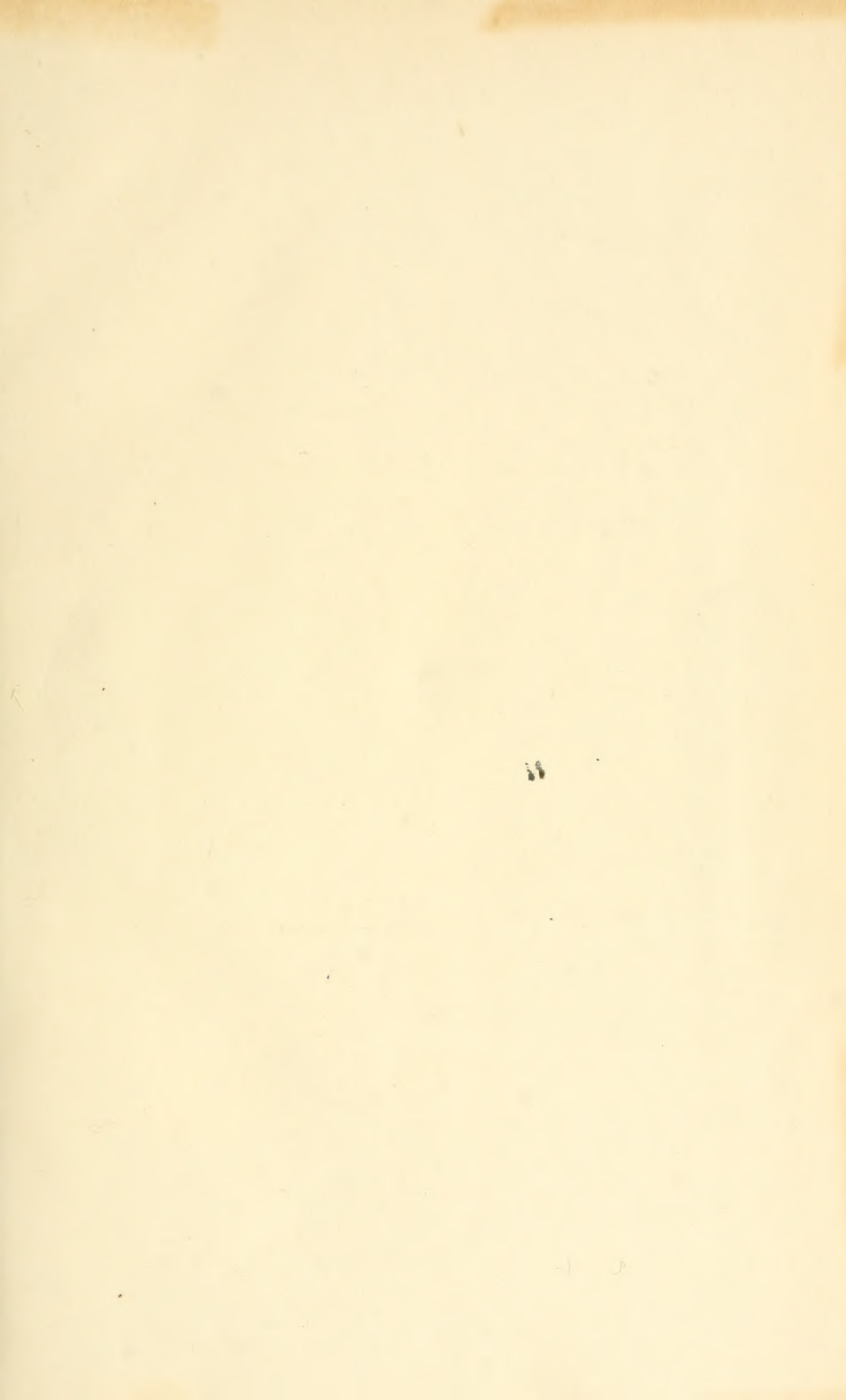
Source New Hampshire

Received October 1911

Cost .....

Accession No. 17333















STATE OF NEW HAMPSHIRE.

NEW HAMPSHIRE  
COLLEGE LIBRARY

REPORTS, 1909 - 1910.

VOLUME IV.---BIENNIAL.

CONCORD, N. H.  
1911.

STATE OF NEW HAMPSHIRE  
COLLEGE  
LIBRARY  
187

NH  
353.9  
N5325  
1909/10  
v.4

REPORTS 1909 - 1910

BOUND BY GEORGE G. NEAL, DOVER, N. H.

VOLUME IV - BIENNIAL



## CONTENTS.

---

MESSAGE OF HIS EXCELLENCY THE GOVERNOR.

REPORT OF THE BOARD OF HEALTH.

REPORT OF THE BOARD OF AGRICULTURE.

REPORT OF THE TRUSTEES OF THE STATE HOSPITAL.

REPORT OF THE LICENSE COMMISSION.

REPORT OF THE PHARMACY COMMISSION.

REPORT OF THE TRUSTEES OF THE STATE NORMAL SCHOOL.

REPORT OF THE STATE LIBRARY.





MESSAGE  
OF  
HIS EXCELLENCY  
ROBERT P. BASS  
GOVERNOR OF NEW HAMPSHIRE  
TO THE TWO BRANCHES OF  
THE LEGISLATURE

---

JANUARY SESSION  
1911

PRINTED AND BOUND BY  
RUMFORD PRINTING COMPANY  
CONCORD, N. H.

## GOVERNOR'S MESSAGE.

---

*Gentlemen, Members of the General Court of the State of  
New Hampshire :*

The permanent success of a representative democracy depends primarily on two conditions, first, that the government shall not fall under the control of any group, class or portion of the community, secondly, that those elected to office by the people shall keep faith with their constituents. It should be a source of profound satisfaction to every thoughtful citizen interested primarily in the welfare of this Republic that the country is being stirred today from end to end with political unrest. There can be no progress without movement, and the political movement in the United States today means, to my mind, that the people are meeting the emergency of the hour, that they will make our representative government as successful under the new conditions of our civilization as it has been under the old. So sudden and gigantic has been our growth that to us have come greater riches than to any other nation on the face of the earth. I believe that the people of the United States will rise to the height of their opportunity, that they will be able to make use of the great wealth and resources which Providence has granted to them without succumbing to the control and domination of wealth, which has so often proved the destruction of nations. It should be borne in mind, however, that a spasmodic awakening to the importance of the fundamental principles which underlie our form of government is not

sufficient to secure and retain control of that government in the hands of the people. There is necessity for the continued interest of every public-spirited citizen, there is necessity for hard constructive work, in which every citizen should have a share. Here in New Hampshire during the coming months the General Court will be occupied in constructive work of the greatest importance to the welfare of the State. During these months it is the civic duty of the people of New Hampshire to help in putting through those measures which they desire to see written on the statute books and which justice and government by the people require.

Although, in the selection of their officers and representatives, the people act through the machinery of parties, nevertheless they have chosen us to serve the interests of the State as a whole. There is a demand on the part of the citizens of New Hampshire, irrespective of party, for certain progressive legislation which will develop the function of our government to meet new economic conditions. The platforms of both parties call for action of this character. We are in honor bound to do everything in our power to carry out each and every pledge which we have solemnly made to the people of New Hampshire, and which they have endorsed. Let me urge you all not to allow party strife to interfere with the wisdom of your deliberations and the effectiveness of your actions, but rather to work together in harmony towards that common goal of progress, the general welfare of New Hampshire.

You will be called upon to consider some of the most important and intricate problems submitted to any legislature in our State for a generation. They will require the most diligent investigation before they may be wisely solved. Hard as is the task, its successful accomplishment will bring to you a worthy place in the history of New Hampshire.

Therefore, let me urge you to reverse the custom of some previous legislatures. Frequently it has happened that little or nothing has been accomplished during the first

few weeks of the session. Weighty measures affecting the interests of the whole State have been left to the last. Too often this has led to trading and log-rolling in regard to bills of importance which should have been considered solely on their merits. I cannot urge you too strongly to take up without delay the consideration and investigation of the many difficult questions before you.

Governor Quinby addressed you yesterday relative to the work accomplished by the different state departments during his administration. He has told you of the very gratifying condition and progress of our various state activities. I shall, therefore, confine myself chiefly to the consideration of future action on our part. Owing to the large number of live questions now under consideration, it will be impossible for me in this message to treat, as I should like, all the functions and services of many of the departments of state.

#### STATE FINANCES.

The condition of the State finances is as follows:

##### *Receipts.*

	Sept. 1, 1908,	Sept. 1, 1909,
	to	to
	Sept. 1, 1909.	Sept. 1, 1910.
Revenue Receipts . . .	\$1,009,030.92	\$1,694,636.54
Non-Revenue Receipts . .	1,082,096.37	1,351,579.58
	<hr/>	
Total Receipts . . .	\$2,091,127.29	\$3,046,216.12

Of the non-revenue receipts for 1909-1910, \$250,000 was received from the sale of highway bonds. Cash on hand September 1, 1910, was \$379,444.87.

##### *Expenditures.*

	Sept. 1, 1908,	Sept. 1, 1909,
	to	to
	Sept. 1, 1909.	Sept. 1, 1910.
Total Expenditures. . .	\$2,022,085.43	\$2,666,771.25

The net indebtedness of the State September 1, 1910, was \$1,293,209.33, a reduction over the previous year of \$128,-591.85.

The following bonds maturing must be provided for by you:

Bonds Due July 1, 1911 . . . . .	\$175,000
Bonds Due July 1, 1912 . . . . .	10,000
Bonds Due Jan. 1, 1913 . . . . .	75,000
	<hr/>
Total . . . . .	\$260,000

The State Auditor estimates the total receipts, with a state tax of \$600,000, for 1910-1911 . . . . .	\$2,862,025.31
Appropriations authorized by statute for the same period . . . . .	2,617,118.96
	<hr/>
Cash Surplus . . . . .	\$244,906.35

The total receipts include the issuance of \$250,000 high-way bonds now authorized by statute. Should the State debt not be increased by the issue of these bonds, there would be a slight deficit at the close of the financial year.

It will be seen that the strictest economy is necessary to maintain the present satisfactory financial condition of the State. It is of the utmost importance that direct taxation be not increased.

#### STATE AUDITOR.

The establishment of the office of State Auditor by the last Legislature has proved of decided benefit in effecting economies and exact conformity to our laws respecting expenditures.

The State Auditor is collecting estimates for the two years next ensuing. These data tabulated, printed with brief explanation and distributed to the members of the Senate and House would assist your committees in the consideration of appropriations.



## ECONOMIES OF ADMINISTRATION.

The necessary extension of governmental functions must naturally increase expenditures, but there should be no unnecessary outlays. All demands should be scanned with the greatest care. Where intelligent investigation shows real need for additional funds, such demands should receive your sympathetic consideration in the light of the resources of the State. It should be the desire of every department head, not merely to extend his work for the good of the State, but to endeavor by concentrated effort, by proper organization and by securing the most efficient service, to reduce the annual charges of his department.

## SYSTEMATIC APPROPRIATIONS.

The practice instituted at the last session of the Legislature, whereby the expenditures for each year were incorporated in a budget bill, was helpful in obtaining systematic appropriation. This practice should be continued.

In order to avoid ill-timed or ill-advised allowances and, in order that a fair division of the revenue of the State amongst the different branches of the government be made, I recommend that a comprehensive plan be framed to cover a series of years. Although such a plan will not be binding on succeeding legislatures, it will serve as a valuable and authoritative guide. It should be based on an investigation and consideration of—

1. The present needs of existing State institutions and enterprises.

- a, Maintenance.

- b, Improvements and extensions.

2. Future needs of these institutions in the light of information now obtainable.

- a, Maintenance.

- b, Additions.

3. New institutions on lines of State activity.

4. What economies or retrenchment may be effected without decreasing the efficiency of the service rendered.

From the findings of such an investigation the State should be enlightened relative to—

1. The extent of the problem involved in the present and future care of its sick and dependent.
2. The wisest and most effective plan for the application of its resources available for such purposes.
3. What appropriations are most urgently needed at this session.
4. What sum the State can devote annually to its charitable and penal institutions.

At this session you will be asked to appropriate money for many purposes, among them the following:

The establishment of a state industrial school for girls.

The establishment of a state workhouse for those convicted of petty crimes.

A dormitory for epileptics at the State School for the Feeble-Minded.

An appropriation for the treatment of indigent crippled and tuberculous children.

The erection of a new building for housing the 124 insane still remaining at county almshouses.

Provision for the proper isolation and treatment of those affected with tuberculosis both in its incipient and advanced stages.

The care by the State of the insane, the dependent, and those mentally deficient, has been of inestimable benefit to those unfortunates. Our State charitable and penal institutions should be developed and maintained to the highest degree of efficiency consonant with our income. Most of these institutions ask every year for additional buildings or equipment, often unquestionably badly needed. It should be borne in mind, however, that the revenues of the State are distinctly limited, consequently it is important that we use the public funds where they are most needed and to the best possible advantage.

## CORPORATIONS AND POLITICS.

There is a universal demand on the part of the people of our State that corporations get out and keep out of politics. Heretofore, they have been in politics for their own selfish ends, and to a degree that was highly injurious to the interests of our citizens.

The President of the Boston & Maine Railroad has recently emphatically expressed his intention of taking his corporation out of politics. He has declared his purpose of coming openly and frankly before the Legislature to ask for such action as in his judgment is needed by his corporation.

It is most desirable to bring about a proper relation between corporations and the people whom they serve and from whom they primarily derive their privileges. We should do all in our power to further such conditions. To that end, let us see that the corporations receive fair play in every instance and that they be not subjected to any unjust legislation. On the other hand, we should vigilantly scrutinize all proposed legislation. During our tenure of office we are the trustees of the rights of the citizens of New Hampshire, who elected us to carry out certain definite policies.

## PUBLIC UTILITIES COMMISSION.

All our enterprises, whether agricultural, industrial or commercial, are to some extent dependent upon transportation. In this State the railroad and express companies have virtual monopolies, consequently it is of vast importance to our people that there be adequate regulation of these corporations. We should also have the same regulation of the telephone, telegraph, light, heat and power companies, to the end that they may be so dealt with as to protect the right and interest of the public. The platforms of both parties call for the abolition of the present Railroad Commission. The functions of the Commission as now constituted are limited in scope. There is a lack of precision

in the statutes by which the powers of the board are granted and an absence of proper means to enforce its findings. I recommend that you create a public service commission to take the place of the present Railroad Commission. It should have authority fully to regulate rates, service and capitalization of all public service companies. For this most important and difficult service the highest grade of men should be secured. To this end reasonable salaries should be granted. Appointments should also be made, for terms of substantial length, to the end that the commissioners may be removed as far as possible from political influences.

#### RAILROAD RATES.

By statutes passed in 1883 and 1889, the State authorized railroad consolidation, but only on condition that rates for fares and freights should not be increased beyond those then existing.

The Boston & Maine Railroad availed itself of the authority thus conferred, and thereby accepted the conditions upon which the authority was granted. The conditions were observed until about 1903, when many rates were increased without legislative authority. In 1908, the Attorney-General instituted legal proceedings in behalf of the State to enforce the statutory provision against such increases. The Supreme Court held unanimously that these conditions were binding upon the railroad. These illegal rates are still in force.

In view of the declared intention of the officers of the Boston & Maine Railroad to come before the Legislature and ask for action legalizing existing rates, I have talked with the General Solicitor of the railroad and with many citizens and attorneys of our State not connected with the railroad, and I have come to these conclusions, which I suggest for your consideration.

While expressing its intention of complying with this provision of the law, the railroad asks relief therefrom. Its officials represent that increased operating expenses,

including a large advance in wages, necessitate higher rates in order to meet expenses and pay a reasonable return on the present and future capitalization of the corporation. They maintain further that the present low rates required by law will hamper the railroad in raising the funds necessary for the improvement and betterment of the property.

This declaration and claim on the part of the railroad should receive your immediate consideration. It is most desirable that such improvements be installed as will provide better transportation facilities within our State with the least delay possible. You should treat this whole matter with the utmost fairness and impartiality. The development of our railroad under an economical and progressive management is an important factor in the growth and prosperity of our commercial, industrial and agricultural enterprises. Such development should not, however, be accomplished in a way to lay an undue burden upon the public at present and for all future time.

The statutes authorizing the consolidation gave to the State a unique power of control over rates that should not be surrendered. As long as this law is on the statute books it should be enforced. The questions involved are very intricate and of vital importance, not only to us but to coming generations. You will bear in mind that practically all the data involved are in the hands of the party seeking relief, that its case will be prepared and presented by the most eminent attorneys and skilled experts that money can provide. It is clearly your duty to see that the interests of the people are equally well represented and safeguarded. Every presumption should be made in favor of the continuance of ancient safeguards established for the defence of the rights of the people against oppression of monopoly and those safeguards should neither be withdrawn, released nor suspended except for strong reasons clearly demonstrated. On the other hand, you should not use your power to oppress either individual or corporation, but to do exact justice to all. You should not decide upon



any form of remedy until you have the facts clearly before you. It should be borne in mind that the burden of proof is upon the petitioner who seeks relief from the present lawful rates.

With the information at hand it is difficult to recommend any definite solution of this problem. A possible method of treating the matter is for you to appoint at once a special committee to hold hearings in order to ascertain the facts bearing upon the case. In justice to all concerned this committee should make every effort to prepare and present an early report on these facts.

If, upon this report and upon all the information at your command, you are satisfied that the railroad has substantiated its claims as to the necessity for some relief and if you find such claim to be equitable and just, you could incorporate in the act creating a public service commission the following provisions:

1. That the commission shall have power to provide temporary relief from any burdensome condition for a definite limited period.

2. That it be made the immediate duty of this commission to make during this period of temporary relief an exhaustive investigation of all rates affected by the statutes of consolidation.

3. That the commission shall have full power to deal with all questions relating to the reasonableness or unreasonableness of any rate or rates and to make and enforce their orders and decrees in respect thereto.

4. That at the same time there shall be specifically reserved and retained in the State all the rights which it now has over all such rates.

You will appreciate the importance of giving to this commission ample facilities and powers and funds for the conduct of this work.

The final determination of the reasonableness of any particular rates should rest only upon a more complete investigation than it is within our power to make during this session.



## EXPRESS RATES.

On the petition of the State Board of Trade the Railroad Commissioners held a prolonged hearing some years ago and took much testimony relative to express rates in New Hampshire. As a result of this hearing the State Board of Railroad Commissioners made a ruling ordering reductions in express rates. These lower rates have not yet been put in force. The express company took an appeal to the Superior Court. The whole matter is still pending, for there are no funds available to prepare and conduct this case for the State. Experience has taught us that effective regulation is essential to protect the public from exorbitant rates. We are not getting effective regulation of express rates. As a first step to that end, I recommend that the Attorney-General be directed to represent the interest of the State in this appeal and that the necessary funds be provided therefor. Such action should be taken at once in order that the public may be subjected to no further delay in the proper adjustment of these rates. There should further be provision for the appearance of the Attorney-General, when so directed by the Governor, at hearings of the Interstate Commerce Commission relative to fixing rates and service on traffic partly within the State of New Hampshire.

## THE ATTORNEY-GENERAL.

The business interests of the State have for many years been constantly increasing, consequently more work falls upon the legal representative of the State. I recommend that the Attorney-General be required to give his services exclusively to the duties of his office and that his salary be correspondingly increased. His duties and authority should be fully defined. He should be at the Capitol when the Legislature is in session.

## TAXATION.

The general belief in the inequalities of our system of taxation led to the appointment of what is known as the Tax Commission of 1908. After exhaustive research, the findings of that Commission were embodied in a report which should be made the basis of an effective legislative program to remedy the inequalities now existing.

There is at present great discrepancy in the valuation of property for the purposes of taxation throughout the State. Real estate is now appraised too high in comparison with other property. To remedy existing inequalities, the Tax Commission of 1908 recommends the following action, in which recommendation I concur,—the creation of a permanent tax commission with the power to correct local inequalities of assessment. Our existing laws call for the appraisal of all taxable property at its full and true value in money. This is rarely done at the present time. Such a Commission would see to it that all property is so appraised at its full value, thereby effecting a corresponding decrease in the rate of taxation.

It would also appraise the property of our public service corporations. They should bear their fair share of the burden of taxation, no more, no less. In order to avoid differences of opinion, haphazard valuations and consequent litigation, the Commission should be instructed as to the method to be pursued in reaching such valuation. Furthermore, the fullest publicity concerning the findings of the Commission is recommended. In this connection, I suggest for your consideration that bill which was passed by the last House of Representatives and which was known as the "Wyman Bill."

When this system is put in force you should provide for some new method of taxing timber lands. Where the timber is all cut at once, our forest lands yield an income at intervals of from forty to eighty, or one hundred years. Appraised at their full value, they would be called upon to bear a greater proportion of the burden of taxation than the return from such land would warrant. The reason for

this lies in the fact that the income derived from such property is so long deferred. During this entire period, the owner must advance the taxes without any expectation of return until his crop matures, in forty, fifty, or seventy-five years, as the case may be.

The report of the Forestry Commission of 1908 and the report of the Tax Commission of that year both contained the same suggestion for a new method of taxing timber lands. I recommend it to your consideration. I do not believe that timber land should be exempt from taxation, but it does seem reasonable that a portion of such taxes should be deferred until the timber is mature or the crop harvested, when the entire tax should be paid. Such a method can best be applied first to young growing timber.

#### RAILROAD TAX APPEAL.

The Board of Equalization for the year 1909 increased the tax assessed upon the property of the railroads, telephone and telegraph companies in the State from \$488,419.48 to \$793,564.84. Practically the same assessment was made for the present year. The railroads have appealed from both assessments to the Supreme Court, where the case is now pending. I call your attention to the fact that this assessment was made by a responsible board acting in good faith and upon honest convictions. Principles are involved which will have a far-reaching effect upon future assessments. Various persons have performed services without compensation, in the preparation of the State's case. The Attorney-General has no funds at his command with which to pay for such services, nor for the expenses necessary in carrying the case to its conclusion. I recommend, therefore, that sufficient money be appropriated for the use of the Attorney-General in these cases. The protection of the rights of the State in this litigation requires immediate legislative action.

## CONSTITUTIONAL CONVENTION.

A large majority of the voters who expressed themselves at the last election as to the advisability of calling a Constitutional Convention voted in favor of such action. I recommend the enactment of a measure calling for the election of delegates to such a convention.

The Convention should be held at the earliest possible date, in order that any amendments adopted by the people may be available at the next session of the Legislature. As the constitutional powers of the Legislature in this respect are questioned, inquiry should be made of the Supreme Court as to whether delegates to the Convention can be elected and proposed amendments be submitted to the people, at special elections called for that purpose.

## INCOME TAX AMENDMENT.

I recommend the ratification of the proposed amendment to the Federal Constitution authorized by Congress whereby the National Government is given authority to impose a tax on incomes.

## CORRUPT PRACTICES.

Every possible step should be taken to put a stop to the buying of votes at the primaries and at general elections. The continuation of this practice will surely undermine the very foundation of our government. I strongly urge you to take such action as will, in your judgment, put a stop to this evil.

The expenditures of candidates and of political parties should be subject to reasonable limitation, and the purposes for which such expenditures may be incurred should be prescribed by law. Candidates for important offices and all political committees should be required to file a sworn public statement of their campaign receipts and expenditures before and after the primaries and general elections.

All contributions by corporations for political purposes should be prohibited by law.

## THE DIRECT PRIMARY LAW.

I recommend the extension of the direct primary law so that delegates to National Conventions shall be chosen by the direct vote of the members of each party.

I also urge upon you the consideration of extending the direct primary law so as to embrace the nomination of candidates for the United States Senate. Personally, I favor the nomination of candidates for the United States Senate by direct vote of the people.

## EMPLOYERS' LIABILITY AND WORKMAN'S COMPENSATION.

The new conditions attending the growth and development of our industrial enterprises make it desirable that the common law now in force relative to contributory negligence, the assumption of risk, and the so-called "fellow servant" doctrine be largely modified by statute. Many states and the Federal government have already taken such action.

I urge you to give this matter your early attention and to enact such legislation as will better protect our workingmen and women, and those dependent upon them, in the event of accidental death or injury while employed by public service corporations and in industrial establishments. In the consideration of this question I refer you especially to the New York liability law enacted under Governor Hughes' administration and at his recommendation, and to the Federal Employers' Liability Act enacted during the administration and at the suggestion of President Roosevelt.

Supplementary to the foregoing, we should have a workman's compensation act, which should secure a certain fixed sum graduated in amount to the injury received, irrespective of the negligence of either party. This should likewise apply to our industrial enterprises and public service corporations.

The financial burden of the industrial accident should be frankly recognized as part of the cost of production. It is time that the community at large pay this debt of flesh



and blood, which it is in honor bound to take from the shoulders of those least able to bear it, the families of the workingmen. On this subject I wish to quote from a speech of so able and conservative a lawyer as Senator Root of New York:—

“It seems to me that our present system of dealing with those injuries that come to the employees in our great industrial life is foolish, wasteful, ineffective and barbarous. The cost of support, which is made necessary by the injuries suffered in a business, is just as much a part of the cost of the business as the tools that are worn out and the material that is consumed. It ought to be paid for by the business as a part of that cost and not left to the charity of the Nation at large.”

The present system of employers' liability is generally recognized as being highly unsatisfactory. The New York Commission, appointed by Governor Hughes to investigate this subject, reports the following objections to the existing system:—

1. That only a small proportion of the workmen injured by accidents of employment get a substantial compensation and, therefore, as a rule, they and their dependents are forced to a lower standard of living and often become burdens upon the state through public or private charity.

2. That the system is wasteful, being costly to employers and the state, and of small benefit to the victims of accidents.

3. That the system is slow in operation, involving, of necessity, great delay in the settlement of cases.

4. That the operation of the law breeds antagonism between employers and employees.

They showed that in 115 cases of married men, killed by accidents of employment in Erie County, New York, thirty-eight cases received no compensation whatever, nine more received \$100 or less, thirty-four cases received from \$101 to \$500, fourteen cases received between \$501 and \$2,000, and only eight cases received over \$2,000.



Out of 1,040 cases of injury investigated, 44% received nothing, 33% received less than 50% of money loss in wages and expenses. Of sixty cases of permanent partial disability forty received less than \$100, fourteen received between \$101 and \$500, five received between \$501 and \$2,000, and one received over \$2,000.

At present a large proportion of the amount actually paid by the employer in case of accident or death never reaches the victims of such accident or their dependents. Much of it is absorbed in lawyers' fees and court costs. A well-adjusted and equitable workman's compensation law would, on the one hand, relieve the employer of the expense of fighting all his accident cases and, on the other hand, insure to the employee prompt and reasonable payment without litigation, without delay and without expense.

The drafting and enactment of such a law, although difficult, is to my mind of paramount importance to a large percentage of the people of our state. The change which it would bring about would be in line with the progress and the betterment of conditions for which we are all striving.

#### BUREAU OF LABOR.

It has been clearly demonstrated for some years that the Bureau of Labor in its present form does not justify its existence. It should be either entirely abolished or so thoroughly reorganized that it will be of some real use in advancing and protecting the interests of the working men and women of New Hampshire.

Properly organized factory inspection is one of the available means of preventing industrial accidents. In this connection, I ask you to consider legislation which shall secure proper ventilation and sanitation, the safeguarding of machinery and boiler inspection. As uniformity of laws in this respect in different states is desirable, I recommend to your attention the findings of the National Civic Federation relative thereto.

## CHILD LABOR.

The moral, intellectual and physical development of the children of our State is of fundamental importance. With the coming generations rest the growth and advance of our race and civilization, as well as the safety and permanency of our institutions and government. The State cannot guard its children too zealously during their period of growth and education. To that end our laws relative to child labor should be rewritten. I recommend that the employment of children under sixteen years of age be limited to eight hours a day and that their employment at night be entirely prohibited.

A more effective system of ascertaining the age of minors before they are granted certificates authorizing their employment in factories should be instituted. A more extended and systematic method of inspection for the enforcement of our child labor laws should be provided. This work may well be continued for the present under the direction of the State Superintendent of Public Instruction.

## DEPENDENT MINORS.

Our present laws relating to the care of dependent children are inadequate. So far as possible such children should be given the benefit of wholesome home influences. The experience of other states shows that this can be done under state supervision without large expense, and to the great benefit of these little unfortunates.

## LYING-IN HOSPITALS AND CHILDREN'S BOARDING HOUSES.

Since the last session of the Legislature, lying-in hospitals and boarding houses for infants have been established in certain sections of the State, in considerable numbers. The traffic in little children carried on through some of these institutions has created conditions within our borders, the continuance of which would justly subject us to censure. Humanity and self-respect alike demand that an end be put to these revolting practices. I recommend to you a

thorough investigation of this subject, and suggest as a possible remedy the licensing of all lying-in hospitals under suitable regulations with the provision that they be open to medical inspection; also that all boarding houses for infants and children be licensed and regularly inspected by an agent of the State Board of Charities and Corrections.

#### LIQUOR.

The general policy of dealing with the liquor traffic is a matter for your consideration.

If you determine to continue the present local option law, I recommend to your favorable consideration all such measures as will tend to restrict to a minimum the use of intoxicants. Such towns as vote for no-license should be given the most effective legal protection which can be devised.

Provision should be made for closing all saloons on days when primaries are held.

#### EDUCATION.

The law enacted by the last Legislature providing for state aid to schools has resulted in decided benefit to our common schools. The 150 towns affected raised their average school year to between thirty-three and thirty-four weeks. During the last two years over twice as many teachers have received a state certificate as in the previous fourteen years. The amount appropriated was not sufficient fully to carry the law into full effect. Some twenty towns were cut out this year from benefiting under this act. I recommend that this appropriation be extended to meet the requirements of this law.

It would be well were the State in a position to see that the money so distributed is used by the towns for purposes provided by this statute.

Such funds as are needed for the efficient, but economical operation of our two normal schools should be provided.

## STATE COLLEGE.

The New Hampshire State College at Durham is performing invaluable service to the State in fitting our young men for more progressive and profitable methods of using and developing our natural resources.

It has recently received for the first time the income of the Thompson fund. This should in a measure relieve the State of at least a part of the burden of maintenance, but our State should, nevertheless, stand squarely behind this institution and see that it is maintained upon a high plane of efficiency and usefulness.

## STATE HIGHWAYS.

The law enacted by the last Legislature, which calls for the construction of three state highways from the Massachusetts line to the northern part of the State, provides that these highways shall be maintained at the expense of the towns through which they pass. This provision of the law should be changed. The trunk lines often pass through small towns for a distance of from five to ten miles each. The burden of properly maintaining such roadways is out of all proportion to the resources of these communities; consequently very little maintenance or repair work is done. Unless an efficient system of maintenance is carried out year by year, the initial outlay on these roads will soon be a complete loss. If we are to maintain our state highways, the work must be done and the expense borne in part at least by the State.

The problem of properly caring for these roads is a large one and calls for immediate consideration. Automobile traffic is the chief source of the destruction of our state roads; consequently, I recommend that automobile fees be increased in proportion to the weight and horse power of the machines and that the money so derived be applied to maintaining our state highways.

Under present conditions our state roads promise to become extensive. They require systematic supervision

under plans which should extend over periods of years. Under these conditions it is a question whether they should be left under the direction of the Governor and Council, whose duties are each year increasing and whose term of office is limited to two years.

#### FORESTRY.

The work of the Forestry Commission may profitably be continued and enlarged with the especial view of furnishing better fire protection and creating a state nursery.

As fast as the resources of the State will justly permit, it should acquire forest tracts for three purposes: First, to demonstrate scientific reforestation, thinning and cutting; second, to prevent denudation of our watersheds and to preserve an even stream flow; and, third, to protect the scenic beauties of our mountains, which are a financial asset to the whole state. Under this last head, there is an immediate demand for the purchase of the timber land in Crawford Notch, which in the course of the next two years will be completely cut over. In acquiring such tracts too great precaution cannot be taken to protect the interests of the State from the payment of excessive prices.

#### GYPSY AND BROWN-TAIL MOTHS.

The area within New Hampshire infected by these insect pests is constantly increasing. The state work to control their depredations should be entirely reorganized.

#### WATER POWER.

The proper use and development of water power are essential to the increased prosperity of the State. A thorough investigation of this natural resource should be made by the State in order to ascertain how it may profitably guide, assist and control the development and use of water power within its borders in the interest of the commonwealth.



## CONCLUSION.

With you rests the responsibility of framing and enacting those measures for the good of the State which the people confidently expect. To an unusual extent is the attention of our citizens centered upon you. Today the nation looks to New Hampshire to lead in progress and in blazing the way to better conditions. You will, I know, meet and overcome all difficulties with which you are confronted and, inspired by the great constructive work before you, wisely achieve all that is expected of the Legislature of 1911.











# TWENTY-FIRST REPORT

(EIGHTH BIENNIAL)

OF THE

# STATE BOARD OF HEALTH

OF THE

STATE OF NEW HAMPSHIRE

7

FOR THE FISCAL PERIOD ENDING AUGUST 31, 1910

---

CONCORD, NEW HAMPSHIRE  
1910.

Printed and Bound by the  
RUMFORD PRINTING COMPANY,  
Concord, N. H.



## STATE BOARD OF HEALTH.

HENRY B. QUINBY, Laconia.

ATTY-GEN. E. G. EASTMAN, Exeter.

G. P. CONN, M. D., *President*, Concord.

CHARLES S. COLLINS, M. D., Nashua.

ROBERT FLETCHER, C. E., Hanover.

IRVING A. WATSON, M. D., *Secretary*, Concord.

---

## STATE LABORATORY OF HYGIENE.

IRVING A. WATSON, M. D., *Director*, Concord.

CHARLES D. HOWARD, B. S., *Chemist*, Concord.

WALDO L. ADAMS, B. S., *Assistant Chemist*, Concord.

H. N. KINGSFORD, M. D., *Bacteriologist in Charge*, Hanover and Concord.

CHARLES DUNCAN, M. D., *Bacteriologist*, Concord.

GEORGE S. GRAHAM, M. D., *Assistant Bacteriologist*, Hanover.

WALLACE F. PURRINGTON, B. S., *Inspector*, Concord.

STATE OF NEW HAMPSHIRE.

---

OFFICE OF THE STATE BOARD OF HEALTH,  
STATE HOUSE, CONCORD, September 1, 1910.

*To His Excellency the Governor and the Honorable Council:*

I have the honor to submit herewith, in accordance with the laws of the State of New Hampshire, the twenty-first report of the State Board of Health for the two fiscal years ending August 31, 1910.

Respectfully submitted,

*Irving A. Watson*

*Secretary.*

# REPORT.

---

In the report herewith presented, only a part of the work done by the state board of health during the fiscal period represented can be considered. We can include only some of those things that are generally instructive and of value as a matter of record. The voluminous correspondence, relative to the management of communicable diseases, questions asked by individuals, local boards of health, boards of education and by other organizations relative to local matters—the pollution of water supplies, the draining and sewerage of towns, the sanitary improvements of summer resort localities, hotels and boarding houses, the interpretation of the Food and Drugs Law, etc.,—while interesting and educational, cannot be incorporated in this report without enlarging the volume to an extent not advisable nor even permissible under the appropriation allowed for publication.

## WATER SUPPLIES.

Elsewhere in this report is shown the record of the examinations of public water supplies of the state at the laboratory of the board. This record is a continuous one, covering a period of several years, and is presented in this form for reference purposes.

It is the policy of this board to make such occasional examinations of our water supplies as may be deemed advisable, in order that any deterioration in the quality of a given supply may be investigated and remedial measures be inaugurated. An analytical examination of these records will show that many supplies have been materially improved. In some instances it has been necessary for the board to make a personal examination, to ascertain the topographical surroundings of the source of the supply, in order to recommend the necessary changes to protect the supply.

A few special reports will be found in connection with the general report.

## SANITARY INSPECTIONS.

The last Legislature enacted a law providing for a sanitary inspector to act under the direction of the State Board of Health; to make

examinations of certain meat supplies, the sanitary conditions of slaughter-houses and places where meats are kept, the methods of preparing meat products for sale; to investigate the general food products of the state, in order to detect violations of the Pure Food Law; to collect samples for analysis at the State Laboratory of Hygiene, and, under the direction of the board, to inspect local sanitary conditions in conjunction with local boards of health when requested, or when deemed advisable by the State Board.

Several months elapsed after the passage of this act, before an inspector was selected, which position was then filled by the appointment of Mr. Wallace F. Purrington, who was, for a considerable period, assistant chemist at the State Laboratory of Hygiene, and who is proving to be an efficient officer.

A large amount of inspection work has already been done, which in many instances has proven to be of great value—as will be mentioned below.

#### SLAUGHTER-HOUSE INSPECTION.

Under the direction of the board, an inspection has been made of many slaughter-houses and other buildings in which animals are slaughtered for the market. In some instances the most unsanitary conditions were found, but, as the law does not authorize an inspector to do more than to *recommend* changes in such cases and as the local boards of health have no specific power in the premises, it has been difficult to bring about the desired result in some instances; in others, the fear of publicity, alone, has been sufficient to secure some reforms.

As an illustration of some of the conditions found, the following transcript is given from the inspectors' report, suppressing only the names of the proprietors and the localities:

. . . . This place is filthy. The slaughtering floor is covered with manure and old blood. No means for water is at hand, and it is a great distance to any building. In one corner of the floor were piled up skulls, hoofs, and parts of carcasses which were black with age. A near-by tieup looked as if it were never cleaned.

. . . . This is another filthy place, even worse than the preceding. The stench from a hog-pen below the floor which received the blood and offal, was disgusting. Here, also, were old skulls, etc., and the combination gave rise to powerful odors. The slaughtering floor itself looked as if it were never cleaned, and the manure lies in cakes where

the cattle are killed. The tieup is filthy with manure, and this is one of the approaches.

. . . . No attempt is made here to keep things clean. The place is dark and badly ventilated. There is a small hole in the wall, as in a coal bin, through which horse manure comes onto the slaughtering floor. Fresh manure was seen in the middle of the slaughtering floor, and the man of the place had gone away and left it. Separating the horse-stall from the floor was a horse blanket. There was no water for cleaning purposes.

. . . . This is a small building, divided by a partition into two parts: In one is kept a horse, and the slaughtering is done in the other. The horse, to get to his stall, has to cross the slaughtering floor, and evidences of manure, both by tracking and otherwise, were noticed. No attempt has ever been made to wash the floor, and there are no facilities for doing so. The cradle used for dressing calves, is in a filthy condition. Offal is fed to hogs under the slaughtering floor.

. . . . Work here is conducted in a shed. Filth and foul odors are very marked. The slaughtering floor is over a hog-pen, to which the offal goes. About the place are old, greasy rags, old dried skins and hair. The refrigerator is filthy. Tools had been recently used, and left unclean.

. . . . This place is filthy. The house is an old place on the edge of a swamp. The floor is apparently never cleaned. No one was present at the time of the inspection, and the place was left with offal, etc., lying about, with no attempt at disposal. No water within half a mile, except the swamp hole in which the hogs run. There was a strong stench. Hogs beneath, within a foot of the floor.

. . . . At this place they kill about ten hogs a week. An open vault is too near the slaughtering floor. The tieup has manure a foot deep in the gutter. A dirty hog-pen is too near the slaughtering floor. The floor itself is of wood, filled with blood, etc. The walls need a coat of whitewash. The place where the offal is deposited is nearly closed in, so that little air gets to it, and the place has a powerful stench.



. . . The slaughtering floor opens up to a yard where hogs are kept, within a few inches of the floor. The hog-pen is full of water in deep puddles. There is a horse-stable close by, and also a filthy tieup for cattle. The slaughtering place is in the barn floor. Swill, collected from the city, is deposited on one side of the floor, and, although covered, the stench was powerful. In the ice-box was a decomposed carcass, which was almost to the point where mold begins. The worst features of the place was the presence of human feces within a few feet of the floor. A seat was there, and under it was the paper and the feces which had become darkened with age. The place was a disgrace to a civilized community.

. . . . Considerable slaughtering is done here at times. Dirty, blood-caked floor about the sides of the walls, and the walls were filthy. The work is done in an old shed, with a hog-pen about a foot below the floor which gets the offal. Old skulls and bones were lying about. No water is used. Chloride of lime is used in the summer.

. . . . Work here is done at the end of the barn, and all the offal, blood, bones, skulls, etc., are thrown into a pit *in the barn*. No hogs are kept, and there was apparently no attempt to cover the refuse. The filthy stuff had been allowed to remain until it was black, and the stench was awful. From hearsay, I understand that the house is not much better. The owner drives a butcher's cart, and does considerable slaughtering when he can get the cattle. This is about the worst place yet seen.

A measure which would have given authority legally to bring about the changes necessary to place such establishments in a reasonably sanitary condition, failed of a passage at the last session of the Legislature. The same bill will be presented to the Legislature of 1911.

#### INSPECTION OF SUMMER RESORTS.

During the past year the board began the inspection of summer-resort localities, hotels, boarding houses, etc., for the purpose of ascertaining the exact conditions pertaining thereto. A great majority of these hotels and boarding houses are not connected with municipal water supplies or sewers; therefore, serious sanitary problems have to be confronted in some instances, while in others entirely inadequate provisions have been made. Where such conditions

have been found, a plan to remedy the defect has been suggested, and, if not agreed to without controversy, the executive authority of the local board of health has to be invoked to secure the needed reforms; but this has seldom been necessary. In most instances, the proprietors of the so-called summer hotels are desirous of maintaining good sanitary conditions, and welcome any suggestions to this end. A large section of the state has been covered in this work, and many suggestions have been made. A demand for some feasible plan of sewage disposal at places not within reach of public sewers, had caused the board to have prepared by its civil engineer, Prof. Robert Fletcher, plans, specifications, and explanatory text to meet such a situation. This will be found elsewhere in this report, and will also be published in a special bulletin for general distribution.

#### THE STATE LABORATORY OF HYGIENE.

The large amount of work done in the State Laboratory of Hygiene is shown, in part, in the reports on the water supplies of the state, food and drugs analysis, and in the statistical tables showing the bacteriological examinations made in that department.

A considerable portion of the work done in the chemical department has been published from time to time in the *Sanitary Bulletin*, but only a small portion of it appears in this report. No compilation of the number of examinations made in the chemical department has been attempted although the number is large, as is shown in bulletins. In the bacteriological department, the statistical report shows that 10,874 examinations were made during the fiscal period embraced in this report.

It will, therefore, be seen that in the two branches of the laboratory a large amount of important analytical work has been accomplished. The laboratory has been removed from rented rooms, to the third floor of the addition to the State House, and is well equipped for all kinds of work legitimately belonging to a laboratory of hygiene. Following is a more detailed statement of its appointment:

#### CHEMICAL DEPARTMENT.

The chemical laboratories, located on the west side of the building, comprise two rooms 20 x 20 and 25 x 16 respectively, being separated from the bacteriological laboratory by the entrance lobby and a small room used as an office. The latter contains a reference library of scientific works, journals, bulletins, etc., and here also are stored the records of analyses, with copies of reports, in the case of all the water, food and drug samples examined since the laboratory was established.

Passing through the lobby, which serves as desk room for the inspector and the assistant chemist, the first laboratory entered is devoted to the examination of foods, drugs and work of miscellaneous character. This room, as well as the water laboratory, is provided with an asphalt floor, laid on cement over arched tiling; this makes not only an absolutely impervious floor but one that is unaffected by chemicals. Excellent overhead lighting and ventilation is afforded by a 6 x 8 transom skylight. Lockers and cupboards are provided for the storage of samples, apparatus and chemicals, and an enamelled refrigerator serves to receive perishable samples, culture media, etc.

The center of the floor is occupied by a large, L-shaped table fitted underneath with drawers and cupboards, and the top of which consists of white, 2 inch, vitrified, hexagonal tiling, laid in reinforced cement and edged by a "nosing" of soapstone. In one end of the main section is a small soapstone sink. From the latter, through the center of the table, extends a soapstone box, which does combined service as a shelf for reagent bottles and as receptacle for the lines of pipe, sets of cocks on either side of this box affording convenient connections for gas, vacuum and air-blast. The two latter are provided by opening cocks at the sink, the water passing through a mechanism of pumps and cylinders, located beneath the table. Sockets are also provided for supplying electric current.

Adjoining one end of the above table is a small table of heavily timbered construction, anchored into the cement, which serves as a support for the centrifuge, with quarter horse-power motor. Another sink, supplied with hot and cold water and used for general washing-up purposes, is located in a corner of the room. Adjoining this is a drain cupboard 4 feet by 18 inches by 12 inches, provided with wire shelves and a bottom board draining into the sink.

The hood, ventilated by two flues leading above the roof, is situated in the partition adjoining the two rooms, there being two compartments in the food laboratory. The double compartment, common to both rooms, is provided with a water-bath, hot plate, igniting racks, etc. The hood tops are of wood, resting on a floor of alberene stone (a variety of soapstone), the whole being supported upon a pipe-frame base.

Communicating with the room just described, is the laboratory devoted to the analysis of waters and liquors. The equipment of this room consists principally of the fixtures from the old laboratory. There is a large, central working-table, 12 feet by 5 feet, one half of

which has been tiled, the other half, of lesser height, serving as a bench for the reception of water samples. A 14-foot wall table, used for distillations, extractions, etc., is specially fitted up with numerous connections for gas, water, waste and current. Adjoining this table is the sink, provided with hot and cold water, a drain closet, and also with a special five-bottle washing device, which permits of the introduction into the bottles of powerful jets of water of any desired temperature.

A feature of both these rooms is the white-tiled window benches, which serve admirably for colorimetric and microscopical work. The equipment above described, includes practically all of the fixtures in use in the former quarters, and with the added new construction, the working facilities have been very nearly doubled, as well as greatly improved. While this will doubtless provide adequately for future growth in the lines of work above mentioned, there is, nevertheless, considerable need of an additional room—preferably in the basement—which might be used, not only for storage and for the rougher work of grinding and preparing samples, but also in a measure for the examination of such materials as asphalts, coals and paints,—a variety of work for which there is already some demand and which,—unless provided for by the establishment of a separate laboratory—is certain to increase largely in the future.

#### BACTERIOLOGICAL DEPARTMENT.

Of the four rooms on the top floor of the new part of the State House, occupied by the Laboratory of Hygiene, the southwest corner room is assigned to the bacteriological department. The room is 19 by 20 feet with two large windows on south and west walls. On the south side at window, is small working desk for microscope and next to this is the desk of the bacteriologist. The west side has a long working bench for microscopic and microtome work. The bench is covered in part with hexagonal tile. On the north side, in corner, is a large soapstone sink with shelf, for use in preparing specimens and doing the necessary stain work. The rest of this side of room is occupied by large hood connected with roof by ventilation flue, sets on soapstone base and contains steam, and dry heat sterilizer, the solidifier and incubator. The entrance to the laboratory is from this side of room. The east side of room is occupied by a large cabinet for storing the outfits used by the physicans in sending specimens to the laboratory and also cabinet for filing records of the work done. The center of room contains working table for general work.



## BOARD OF COMMISSIONERS OF LUNACY.

The State Board of Health constitutes a board of Commissioners of Lunacy, under an act of the Legislature. Its duties are: To make inspections; to examine into the care and treatment of the insane; to keep correct records of the commitments, discharges, and deaths at the state and county asylums, with ages, sex, nationality, etc., and to report to the governor and council, which report is biennially submitted and printed, and may be referred to for detailed information concerning the duties devolving upon the board.

The board has authority to transfer indigent insane persons to the New Hampshire State Hospital, there to be supported by the state, provided that, after an investigation into the financial status of the patient, he shall be found to be entitled to such assistance. This applies to all indigent insane persons, whether or not they may have been supported in whole or in part from public or private sources.

An investigation of each case is required of the county commissioners, or of the mayor and the overseer of the poor in cities, or of the board of selectmen in towns, and they must report to the board upon proper blanks, under oath, regarding such facts as are called for, and which must embody full evidence of the inability of the patient, or of his relatives, legally chargeable with his support, to provide for his maintenance at the State Hospital; otherwise, state aid cannot be granted.

At the close of the fiscal year 1910, there were remaining at the several county institutions, 124 insane persons, and at the State Hospital, 909, a large majority of the latter belonging to the "indigent" class, having been admitted under orders of the Commissioners of Lunacy.

## THE NEW HAMPSHIRE SANITARY BULLETIN.

The New Hampshire *Sanitary Bulletin* has been issued quarterly for the past ten years, and that it is appreciated by the people of the state is shown by the fact that the demand for it has increased its circulation from 2,000 copies (the first edition), to 7,000. It is a medium through which local boards of health, physicians and others are given information relative to sanitary measures and regulations, food and drugs examinations, etc., aside from much general information relating to public and personal hygiene.

We believe that the *Bulletin* has accomplished great good in the line of public education on sanitation. Thousands of copies relative to the restriction and prevention of some of the communicable diseases have been distributed, and the demand is almost continuous for issues



of this kind, for local distribution upon the outbreak of these diseases. The *Bulletin* is furnished free of expense to any citizen of New Hampshire who applies for it.

#### THE NEW HAMPSHIRE STATE SANATORIUM.

A special report of the trustees of the State Sanatorium will be made to the Legislature, but it is not out of place to give that institution mention in this report as one of the agencies that bids fair to be of great public health service to the State of New Hampshire.

At the close of the year, the institution is filled and there is a demand for admission far beyond its present capacity. For the greatest good that such an institution can do, it is imperative that its capacity should be extended. Provision should be made by the Legislature for at least double its present capacity. In other words, two additional wards, one for males and the other for females, and of the capacity of the present wards, should be constructed.

The result of the two years' experience demonstrates beyond successful controversy, the value of this institution in the treatment of tuberculosis. The records show that 40 per cent. of the incipient cases have apparently been cured, and 60 per cent. arrested, showing 100 per cent. of improvement in this class of patients. In the moderately advanced cases, 49.9 per cent. have apparently been cured or arrested, and 21.5 per cent. of the far advanced cases have been improved. This record in itself is a sufficient justification of the establishment of the institution in New Hampshire.

#### VITAL STATISTICS.

The very important records of births, marriages, divorces and deaths which have been collected, classified and properly filed for immediate reference under the direction of the State Board of Health, are at last housed in ample, fireproof quarters, with every convenience for consultation and examination by the public. The collection aggregates, at the present time, a million and a half records, embracing all that have been recorded in the several towns in the state from its earliest settlement to the present time.

These records have become of great importance, aside from showing the movement of the population, for many legal and personal purposes: in the obtaining of pensions, the proving of ages for admission to certain occupations, civil service employment, the determination of property rights, the establishing of ancestral lines for admission to the various patriotic societies, for the compiling of family genealogies, etc.

It is to be hoped that sometime in the near future, provision may be made for transcribing the old church records, so that they may be added to the files of this department.

#### NOTES ON THE VITAL STATISTICS OF THE STATE.

The Registration Report, which is published biennially, contains a mass of statistical information relative to births, marriages, deaths, and divorces, from which the student of the movement of the population can construct other special tables and can make deductions based upon the annual returns to the state. To make investigations of this kind covering a series of years, it would be necessary to consult the reports from the beginning and to devote considerable time to the arrangement of tables covering a series of years.

For the more ready information upon special causes of death, particularly some that merit greater study and more careful consideration, owing to their increasing mortality, than has heretofore been given to them, we are including a few special tables.

The number of births, marriages, divorces and deaths returned to the state for the years 1908 and 1909 was as follows:

	1908.	1909.	Increase.	Decrease.
Births.....	9,270	8,913		357
Marriages.....	4,098	4,079		19
Divorces.....	569	504		65
Deaths.....	7,161	7,282	121	

The proportion of births, marriages, divorces and deaths to each 1,000 of the population for the two years mentioned was:

Year.	Births.	Marriages.	Divorces.	Deaths.
1908.....	21.72	9.60 (couples)	1.33 (couples)	16.77
1909.....	20.79	9.49 (couples)	1.17 (couples)	16.98

#### TUBERCULOSIS.

The one disease that has agitated the public mind more than any other, and to which more consideration has been given in the way of prevention and treatment, is tuberculosis. The results which have followed, largely from the education of the public in the campaign to

suppress the ravages of this disease, are shown in the tables and diagram herewith submitted.

The reduction in the death rate from tuberculosis in New Hampshire, is practically paralleled by that in other states and communities where a campaign of education has been waged. The remarkable results that have been brought about, are an unanswerable argument in themselves for the continuation, more vigorous if possible, of the movement for the suppression of this disease, by educating the public as to its true nature, methods of prevention, etc., and in securing facilities for the proper care and treatment of infected persons.

The table herewith given shows the number of deaths from pulmonary tuberculosis, as returned to the state, by years, from 1884 to 1909, inclusive.

It will be seen that the number of deaths from consumption in 1909 was approximately only one half that of the earlier years included in the table. This reduction, as applied to the living population, is most graphically shown in the accompanying diagram.

DEATHS FROM CONSUMPTION (PULMONARY TUBERCULOSIS) IN NEW HAMPSHIRE FOR  
TWENTY-SIX YEARS, BY AGE PERIODS.

Years.	Total.	1 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Over 80.	Not stated.
1884.....	868	50	113	218	145	93	78	64	67	21	19
1885.....	857	49	98	219	161	109	75	75	43	19	9
1886.....	809	44	87	233	152	94	67	71	37	18	6
1887.....	766	34	88	193	145	101	78	55	46	21	5
1888.....	742	48	88	219	137	71	62	55	42	15	5
1889.....	651	36	81	147	120	77	56	65	53	10	6
1890.....	825	49	77	200	156	113	65	72	63	23	7
1891.....	695	47	87	174	131	89	67	37	43	10	10
1892.....	736	28	88	178	150	84	67	71	41	20	9
1893.....	737	45	71	204	139	92	65	64	34	14	9
1894.....	714	50	70	200	150	82	59	45	45	8	5
1895.....	693	31	66	210	129	85	60	49	51	10	2
1896.....	679	41	81	180	130	85	59	49	37	9	8
1897.....	697	36	79	225	143	70	46	49	32	12	5
1898.....	607	26	53	181	143	66	52	47	22	7	10
1899.....	582	26	57	169	103	80	65	38	28	10	6
1900.....	650	36	70	193	120	76	45	61	44	1	4
1901.....	629	42	57	178	130	71	53	48	40	7	3
1902.....	569	23	62	138	134	83	51	43	24	5	6
1903.....	530	26	47	141	107	66	54	49	31	7	2
1904.....	575	30	43	181	126	74	54	43	18	3	3
1905.....	571	28	54	143	131	95	49	45	20	3	3
1906.....	538	34	54	138	136	76	36	31	22	8	3
1907.....	465	19	39	125	111	67	46	29	21	6	2
1908.....	471	23	46	126	95	69	37	46	21	8	.....
1909.....	466	19	41	116	121	68	42	34	19	5	1
Total.....	17122	920	1,797	4,629	3,445	2,136	1,488	1,335	944	280	148

While we all know, from observation that tuberculosis is a very prevalent disease, and that it has always been so recognized, its exact position as a cause of death in this state has been known only for a period of about twenty-five years.

The registration of deaths in every town and city in New Hampshire was not perfected to any degree of accuracy until about 1884, since

which time our statistics are of great value as a guide in sanitary work. The information which these records give justifies not only the energetic campaign that is being waged against tuberculosis, but also shows what has been accomplished from year to year in the subjugation of this disease.

This is graphically shown in the diagram herewith given.

During the twenty-five years from 1884–1909, inclusive, there was returned to the state a total of 179,914 deaths from all causes. Of this number, 17,122 died of pulmonary tuberculosis. This would give an average of one death from consumption to every ten and a fraction deaths that occurred during that period.

These statistics, as fearful as they look and are, have another side, which represents most conclusively and emphatically what has been accomplished in the diminution of this disease during the past twenty-five years.

In 1884, at the commencement of the period now under consideration, there were returned 868 deaths from pulmonary tuberculosis; while for the year 1909 there were returned 466 deaths from the same cause. It will be seen that the mortality from consumption has been reduced nearly one-half.

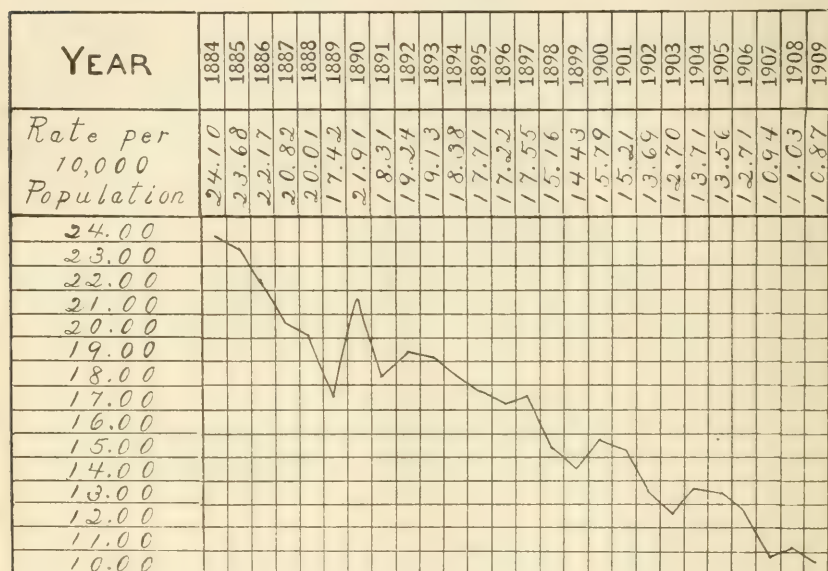
The figures already quoted have dealt wholly with pulmonary tuberculosis, commonly known as “consumption;” but when the disease is to be considered *in toto*, there must be included the lesser phases of it, as tubercular meningitis, tuberculosis of the bowels, scrofula, “white swelling,” and other more uncommon forms of the disease—all of which would somewhat increase the total of deaths due to tuberculosis.

The great progress that has been made in a relatively few years in reducing the death-rate from consumption, is due largely to a better understanding of the nature of the disease; to the exercise of more or less precaution against infection (formerly neglected); to improved environments of the laboring classes; better hygienic conditions in homes, ventilations, etc., and, further, to the fact that in recent years many cases have been cured.

There is another factor, of undetermined magnitude, that is contributing to the reduction of the number of deaths from tuberculosis, and that is the increasing number of persons who are succumbing to diseases of the nervous and circulatory systems—heart disease, Bright’s disease, apoplexy, etc., due to conditions apart from this immediate discussion, but which must, sooner or later, receive serious and careful consideration.



DIAGRAM SHOWING THE REDUCTION IN THE MORTALITY RATES FROM PULMONARY TUBERCULOSIS (CONSUMPTION) FROM 1884 TO 1909, INCLUSIVE.



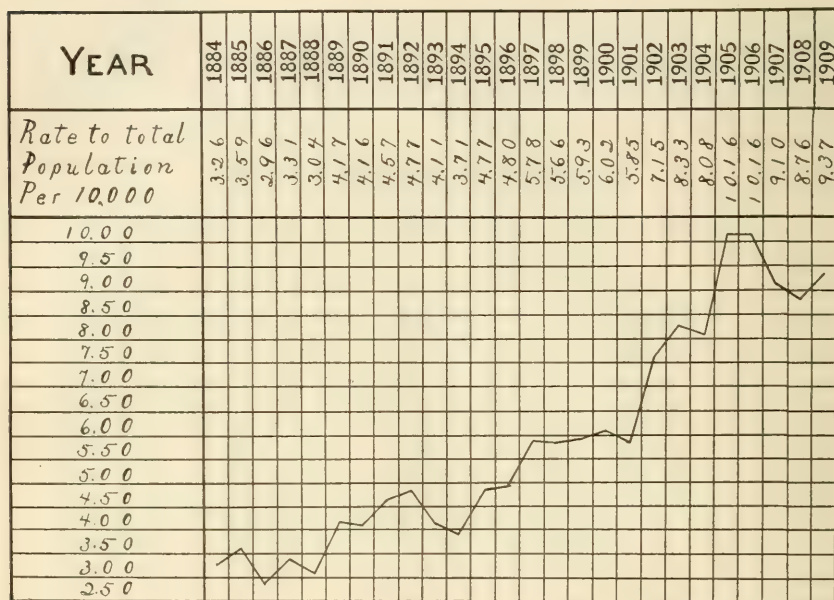
### BRIGHT'S DISEASE.

The increase in the mortality from Bright's disease is of an almost startling nature. It will be seen by the table herewith presented, and also by the diagram, which is based upon the death rate from this disease to each 10,000 of the population, that the records of the past quarter of the century show a progressive increase, from 117 deaths registered in 1884, to 402 in 1909, with annual fluctuations of no great magnitude.

## DEATHS FROM BRIGHT'S DISEASE BY AGE PERIODS, 1884 TO 1909, INCLUSIVE.

Years.	1 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Over 80.	Not stated.	Total.	Rate to total population. (Per 10,000.)	Male.	Female.
1884.....	6	6	9	13	12	23	20	23	3	2	117	3.26	75	42
1885.....	6	9	11	19	15	14	24	24	7	1	130	3.59	78	52
1886.....	3	2	9	8	8	10	28	33	6	1	108	2.96	62	46
1887.....	4	6	6	17	12	16	29	25	6	1	122	3.31	77	45
1888.....	9	3	6	3	15	20	25	25	5	2	113	3.04	78	35
1889.....	3	3	11	16	19	28	34	33	8	1	156	4.17	84	72
1890.....	5	5	5	14	16	24	35	39	11	3	157	4.16	98	59
1891.....	2	9	7	18	16	27	46	34	10	5	174	4.57	113	61
1892.....	7	6	10	16	24	35	37	36	9	3	183	4.77	101	82
1893.....	13	7	10	18	18	18	29	39	7	.....	159	4.11	89	70
1894.....	10	6	14	12	20	24	22	30	6	1	145	3.71	81	64
1895.....	4	8	13	17	23	37	34	38	13	1	188	4.77	110	78
1896.....	6	10	9	18	17	32	39	43	15	2	191	4.80	118	73
1897.....	15	3	11	24	15	38	46	56	20	4	232	5.78	118	114
1898.....	5	7	16	16	15	35	51	65	16	3	229	5.66	136	93
1899.....	11	6	12	16	23	31	50	71	21	1	242	5.93	132	110
1900.....	12	5	15	14	34	35	49	61	20	3	248	6.02	127	121
1901.....	7	5	15	22	26	47	57	44	17	2	242	5.85	139	103
1902.....	8	4	19	20	33	43	64	77	25	4	297	7.15	164	133
1903.....	8	8	18	23	39	58	74	81	36	3	348	8.33	191	157
1904.....	6	4	19	25	34	57	67	76	45	6	339	8.08	172	167
1905.....	13	14	29	33	40	65	90	92	49	3	428	10.16	241	187
1906.....	7	9	19	29	47	67	108	93	36	5	430	10.16	238	192
1907.....	9	8	13	17	34	59	87	110	47	3	387	9.10	236	151
1908.....	10	7	17	25	27	61	74	113	36	4	374	8.76	215	159
1909.....	12	6	9	23	35	67	77	128	42	3	402	9.37	226	176
Total...	211	166	332	476	617	971	1,296	1,489	516	68	6,141	.....	3,499	2,642

DIAGRAM SHOWING INCREASE IN THE MORTALITY FROM BRIGHT'S DISEASE AND ITS RATE TO EACH 10,000 OF THE POPULATION, FROM 1884 TO 1909, INCLUSIVE.



Osler defines Bright's disease as "acute diffusive nephritis, due to the action of cold or of toxic agents upon the kidneys."

It is held that exposure to cold and wet is one of the most common causes of the acute form of the disease, while probably a more prolific cause is the resulting poison of specific diseases, like scarlet fever, typhoid fever, diphtheria, measles, and other acute febrile conditions. Interstitial alterations and degeneration of tissues, and other organic changes lead to the chronic form of the disease, which too frequently follows the acute stage. The chronic form, however, often develops insidiously, without manifestation of acute symptoms.

It would seem that the usual alleged causes of Bright's disease are not sufficient to account for its prevalence in an increasing ratio, far beyond the growth of the population. There must be other causes, not commonly recognized, and hidden, probably, in the daily habits of living, in personal environments, in overtaxing the nervous system, in the competitive struggle of life, in intemperance in eating, in the use of alcoholic liquors, in inadequate hours of rest, and in other habits not in accord with the best known principles of personal hygiene.

The kidney is an excretory organ, and upon it is placed the burden of eliminating many of the toxins following functional or organic disturbances, the non-assimilation of food, overburdened digestive organs, physical overwork, mental strain, and other conditions which should be seriously considered.

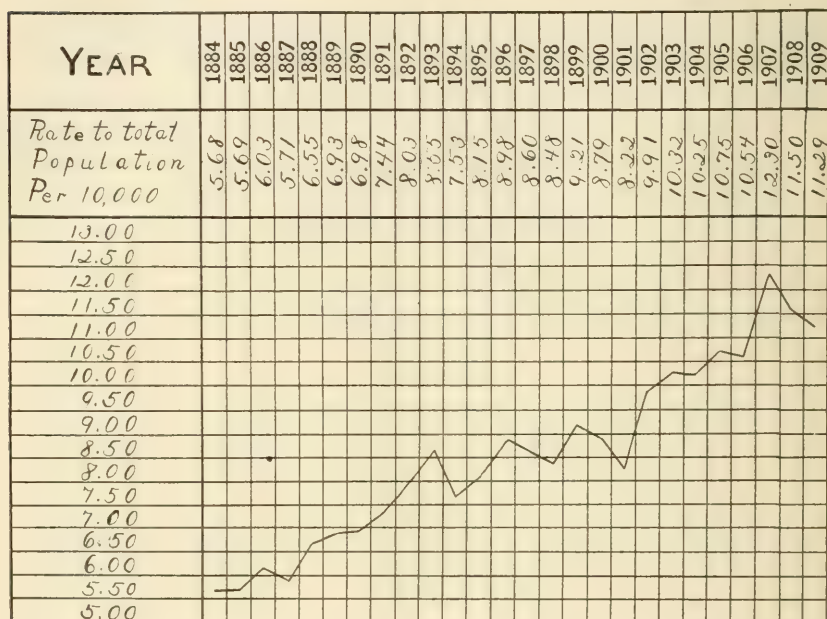
The table above referred to gives the mortality from this disease by age periods and by sex. In studying the latter, it will be seen that the mortality is considerably greater among males than among females, which possibly may be accounted for, in part, by the greater liability of the former to exposure to the vicissitudes of climate, and to the more intemperate habits of that sex.

It is not the purpose of these remarks to do more than to draw attention to the serious aspect of this disease.

#### APOPLEXY.

Deaths from apoplexy during the past twenty-five years, as shown from the mortality returns, have been increasing at a rate that is little short of alarming. It is not the purpose here to discuss to any extent the causes which apparently contribute to make up the high death-rate from apoplexy. Doubtless, however, some of the comments made as to the causes of Bright's disease are applicable to apoplexy. Namely; the daily habits of living, the competitive struggle of life, overtaxing the nervous system, intemperance in eating, the use of alcoholic liquors, and any condition of living which tends to a weakening of the arteries. The diagram herewith presented, vividly illustrates the increase. The facts presented merit more than a passing consideration.

DIAGRAM SHOWING INCREASE IN THE MORTALITY FROM APOPLEXY, AND ITS RATE TO EACH 10,000 OF THE POPULATION, FROM 1884 TO 1909, INCLUSIVE.



### CANCER.

The increase in the number of deaths from cancer is attracting the attention of the civilized world. So marked has been its progress within the last few decades that institutes for the study of this disease have been established in several countries in charge of able and scientific investigators.

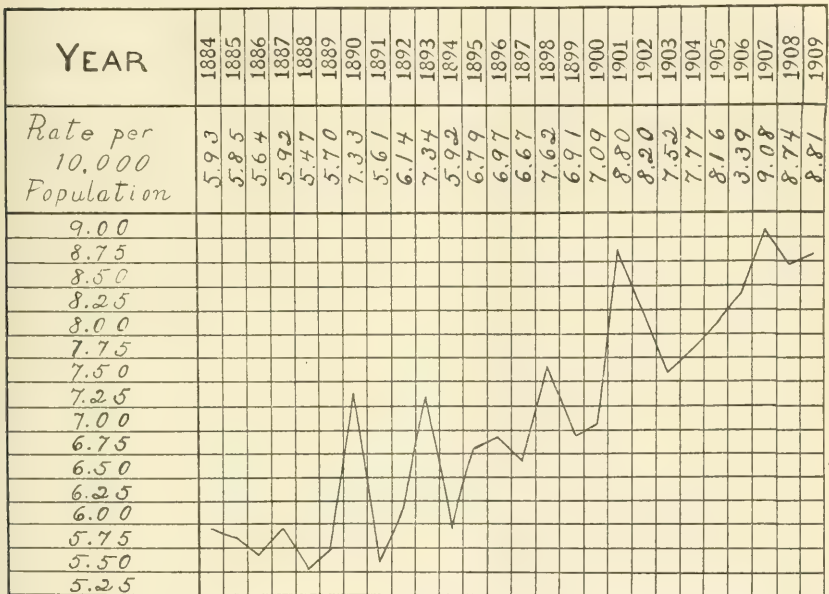
Progress of an encouraging nature towards its control is being made, but up to the present time no specific has been discovered. The early removal of the diseased conditions still affords, by far, the most promising method of treatment. A glance at the table herewith presented shows the mortality from cancer from 1884 to 1909, inclusive, by age periods and sex.

It will be seen that in this period of twenty-six years its mortality has nearly doubled. Its upward trend is most vividly shown in the diagram which illustrates its death-rate to each ten thousand of the population. While the line fluctuates a little from year to year, the upward trend of it is almost startling.



An analysis of the table herewith referred to shows that this disease is far more prevalent in women than in men. During the period mentioned, there were 7,376 deaths from cancer of which 2,442 were males and 4,934 were females.

DIAGRAM SHOWING THE INCREASE IN THE MORTALITY FROM CANCER, AND ITS RATE TO EACH 10,000 OF THE POPULATION, FROM 1884 TO 1909, INCLUSIVE.



The theory advanced by some, that the increase in the mortality statistics of this disease may be due largely to a more accurate statement of cancer as a cause of death on the part of the physician making the return, and to the saving of lives from tuberculosis and other preventable diseases in early or middle life, thereby leaving more persons liable to cancer at the ages most subject to this disease, is, perhaps, correct to a limited extent, but it can hardly be accepted as accounting for more than a limited proportion of the increase.

The record of other states and countries practically parallels our own so far as the increase of this disease is concerned. The statistics of England, Ireland, and Scotland for the past fifty years show that there has been a gradually increasing mortality from cancer. Investigations into its cause, and the seeking to secure efficient methods of



treatment are being so vigorously prosecuted scientifically, today, that there is great hope that this disease will be conquered in the not very distant future.

DEATHS FROM CANCER BY AGE PERIODS AND SEX FROM 1884 TO 1909, INCLUSIVE.

Years.	1 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Over 80.	Not stated.	Total.	Male.	Female.
1884.....	4	1	3	12	28	42	48	50	19	3	210	71	139
1885.....		1		11	30	42	57	56	13	3	213	74	139
1886.....			3	9	17	36	63	48	28	2	206	56	150
1887.....	2	1	3	11	31	46	50	46	23	5	218	70	148
1888.....		1	1	8	27	48	58	41	15	4	203	66	137
1889.....	2	1	3	12	24	36	55	57	22	1	213	70	143
1890.....	2		4	14	37	65	67	60	23	4	276	86	190
1891.....	1		4	17	24	43	64	47	21	1	222	74	148
1892.....	1		5	15	35	51	62	48	15	3	235	69	166
1893.....		1	4	9	48	63	66	55	31	6	283	106	177
1894.....		1	6	15	31	43	63	53	16	2	230	80	150
1895.....		2	2	12	38	49	62	76	25	.....	266	100	166
1896.....	3	2	3	15	31	52	77	63	26	3	275	84	191
1897.....		2	4	25	30	54	62	62	21	5	265	87	178
1898.....			3	16	35	81	79	63	26	2	305	102	203
1899.....		3	3	11	36	69	69	56	28	4	279	89	190
1900.....	1	3	6	16	26	62	84	71	22	1	292	88	204
1901.....	1		5	20	46	74	104	87	24	3	364	114	250
1902.....	1	2	1	15	44	89	90	61	36	2	341	120	221
1903.....	1		2	20	25	74	96	67	27	2	314	110	204
1904.....		2	2	14	40	59	95	77	31	6	326	111	215
1905.....			4	15	48	71	90	93	23	.....	344	126	218
1906.....	2		2	26	48	62	107	78	29	.....	354	109	245
1907.....	2		3	24	60	78	93	81	42	3	386	123	263
1908.....	1		4	25	51	84	95	85	26	2	373	126	247
1909.....	2		2	17	49	79	107	89	36	2	383	131	252
Total.....	26	23	82	404	939	1552	1,963	1,670	648	69	7,376	2,442	4,934

## PNEUMONIA.

The table, herewith given, shows the number of deaths in New Hampshire from 1883 to 1909, inclusive, with age periods. It has become the leading cause of death, tuberculosis having fallen into second place.

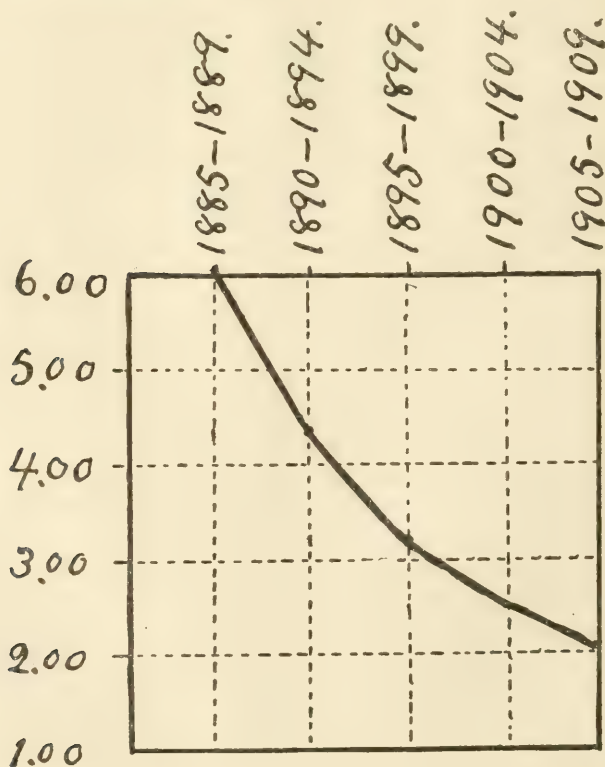
MORTALITY FROM PNEUMONIA IN NEW HAMPSHIRE FROM 1883 TO 1909, INCLUSIVE,  
BY AGES.

Years.	Under 1.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Over 80.	Unknown.	Total.
1883.....	82	.....	5	8	12	30	21	36	45	86	94	66	13	498
1884.....	51	48	3	3	6	27	23	30	36	50	97	54	8	436
1885.....	69	49	8	4	11	15	27	32	37	72	105	74	1	504
1886.....	57	38	13	6	13	17	24	29	49	68	92	53	7	466
1887.....	68	33	7	5	13	28	32	30	48	89	121	68	4	556
1888.....	67	45	6	10	19	40	49	51	62	67	123	81	8	628
1889.....	61	50	8	12	17	29	36	40	48	98	100	79	4	582
1890.....	73	48	9	10	11	35	46	45	79	106	127	107	7	703
1891.....	73	43	15	6	11	43	31	38	74	109	126	95	9	673
1892.....	77	49	13	6	12	41	61	60	95	147	190	128	11	890
1893.....	86	65	15	5	15	36	39	55	60	95	120	88	6	685
1894.....	88	62	13	4	11	29	38	48	63	87	103	83	4	633
1895.....	69	62	11	8	16	27	32	46	57	101	127	74	9	639
1896.....	103	96	8	5	10	22	29	35	34	68	82	63	2	557
1897.....	122	82	13	7	9	22	36	33	56	78	100	87	5	650
1898.....	84	68	12	7	9	25	35	34	31	59	101	55	4	524
1899.....	130	97	19	9	19	25	39	46	50	85	129	99	6	753
1900.....	142	125	14	11	18	48	64	76	95	112	141	88	8	942
1901.....	105	82	13	3	9	41	35	65	55	78	136	89	5	716
1902.....	118	86	14	7	10	35	31	32	51	76	82	73	3	618
1903.....	127	87	19	11	17	26	42	40	54	85	95	78	5	686
1904.....	94	68	12	6	12	27	46	40	60	65	116	84	5	635
1905.....	110	86	13	6	16	26	36	51	54	76	110	100	6	690
1906.....	63	46	9	7	10	18	25	37	61	80	97	63	9	525
1907.....	72	47	11	9	14	26	36	47	47	89	128	74	2	602
1908.....	62	48	11	5	4	24	23	40	44	73	84	71	2	491
1909.....	85	53	12	7	17	31	47	33	44	85	91	71	4	580
Total....	2,338	1,663	306	187	341	793	983	1,159	1,489	2,284	3,017	2,145	157	16,862

## DIPHTHERIA.

The reduction in the number of deaths from diphtheria in this state during the past twenty-five years has been very marked. The number of deaths from this disease in 1908 was ninety-nine, and in 1909, seventy-two, as against the high rate which was annually reported in the earlier mortality periods of our registration reports. A glance at the pen sketch, herewith presented, shows graphically the reduction in the death-rate from this disease by five year periods from 1884 to 1909, inclusive. From 1895 to 1899, inclusive, the death-rate from diphtheria to each one thousand of the population was 6.13; from 1890 to 1894, inclusive, 4.39; from 1885 to 1889, inclusive, 3.10; from 1900 to 1904, inclusive, 2.51; from 1905 to 1909, inclusive, 2.01.

This great and gratifying reduction has been due to the prompt reporting of cases, the increasingly efficient management of local boards of health in quarantine and disinfection, and in the general use of antitoxin. To these agencies must be ascribed the diminishing mortality rate from diphtheria.



## TYPHOID FEVER.

The number of deaths from typhoid fever in the year 1908 was seventy-five; in 1909, forty-eight, the lowest figure reached in the record of this disease.

Since the year 1900 the mortality from typhoid fever for the entire state has not reached one hundred. From the earliest records up to 1895 its mortality always exceeded that figure. The diminution that has taken place is due almost wholly to improved sanitary conditions, better understanding of the nature of the disease and, consequently, disinfection and other restrictive measures have been carried out along lines that formerly were not recognized as necessary. The showing that has been made in the management of this disease is exceedingly gratifying, and with our present knowledge of its nature a still greater reduction is to be expected.

## INFANTILE PARALYSIS. (ANTERIOR POLIOMYELITIS.)

During the year 1909, eleven deaths from infantile paralysis in this state, were reported to the Department of Vital Statistics, and for 1910, to November 1, seventeen such deaths were returned. The mortality does not, however, by any means represent the serious results or the economic loss to the state from this disease, which permanently cripples a large proportion of its victims.

From investigations made during the past year in twenty-three states, it has been established that there occurred more than 3,000 cases in those states during that time. In some localities it has existed as an epidemic, but in New Hampshire it has appeared only in isolated cases. The State Board of Health has requested that every case be reported to the local board of health as soon as it is recognized, and that quarantine measures be taken to prevent its spread, since its communicability has been established beyond question.

Isolation of the patient as completely as possible, with disinfection of sputum and all other excretions, has been and is recommended, together with a limited restriction of the movements of the family, prohibiting any one who is in contact with the patient from mingling with other children during the acute stage of the disease, which is usually from two to three weeks; and that, following a death from the disease, it is advisable to disinfect the premises, and not to hold a public funeral.

As the true nature of the disease becomes better understood, it is possible that other or different measures may be necessary for its control.



---

---

## **WATER SUPPLIES OF TOWNS AND CITIES.**

---

---





# EXAMINATION OF WATER SUPPLIES.

By CHARLES D. HOWARD, *Chemist.*

---

*Dr. Irving A. Watson, Secretary, State Board of Health:*

DEAR SIR: The following report is submitted of the work of the laboratory in the examination of water supplies for the biennial period ending August 31, 1910.

During the two years which this report covers, a total of 1897 samples of water has been examined. These may be classified as follows: samples representing public (town or city) supplies, 437; semi-public supplies, 288; from private or individual sources, 1172.

## *Public Supplies.*

The total number of public supplies to date is 102, the ownership being very nearly equally divided between the town or precinct and private individuals or corporations.

One new supply added recently is that of the precinct of New Hampton. This is a pond of some size, located near the summit of a considerable elevation. It not only affords an abundant domestic supply of excellent character, but gives the village exceptional fire protection.

During the period mentioned no epidemic directly chargeable to the character of a public water supply has occurred, so far as the matter has come to our attention. In the autumn of 1908, the pond supply of the town of Antrim became very much impaired, due, as investigation proved, to low water and the wallowing of cattle in the pond. This condition was early detected, however, and it is not known that any serious illnesses resulted.

During December, 1909, several cases of typhoid fever occurred among office workers employed in one of the business blocks of Peterboro, supplied with the town water. It was at first supposed that the infection might have taken place as a result of drainage from a lumber camp situated on a brook flowing into the pond, although no cases of typhoid had been known to occur among these employees. Examination of this brook water failed to show the presence of sewage bacteria, however, and no satisfactory evidence could be secured indicating that the town water supply was the source of the infection.

The practice of periodic inspection of the public supplies has been continued, it being the aim to have submitted at least one or two samples annually from every important supply. The examination of some of the smaller supplies has not been kept up, largely for the reason that many of such are not ordinarily exposed to contamination and the local authorities have failed to evince any interest in having such analyses made. On the other hand, many of the larger supplies are subjected to frequent examination.

### *Samples from Private Sources*

The work of examination of samples from private sources seems to show an increase for this period, notwithstanding that more stringent rules have been in force regulating such service. This work seriously interferes with other lines of inspection and it is regrettable that the idea should have become so generally established that the laboratory can be gotten to make analyses of private supplies under all sorts of circumstances, and as often as the owner may choose to ask. In this connection the following regulations are now in force:

### *Regulations Governing the Examination of Private Water Supplies at the State Laboratory of Hygiene.*

It is not the practice of State Boards of Health to analyze private water supplies. Work of this kind is usually limited to the examination of public supplies of towns and villages, samples of which will be received only through the usual official channels.

Continuing the original policy of the Board, examinations of private supplies other than on request of physicians or members of Boards of Health will be made under the following restrictions:

1. A person desiring the analysis of a private water-supply must fill out the blank upon the face of this sheet, stating the reasons for this request fully and explicitly.

2. No water will be examined simply to satisfy the curiosity of any one, or to substantiate a belief that it is pure. There must be some valid reason given involving a question as to the quality.

3. Where the latter is based only upon the existence of sickness in the family, the request should either come through the attending physician, or this application should bear his endorsement.

4. No water sample will be accepted for analysis unless taken according to instructions and forwarded in the outfit supplied by the

Laboratory. An exception to this rule may be made at the discretion of the chemist in the case of samples to be examined for lead only.

5. Following the granting of an application, an outfit, with full instructions, will be sent to the applicant. No charge will be made for the analysis, but the recipient must pay all express charges.

IRVING A. WATSON,  
*Secretary.*

January 1, 1910.

We have before called attention to the fact that many of the examinations made of private supplies would be totally unnecessary, were the owners to take ordinary pains to maintain these in good condition. Not only is the original examination unnecessary in cases where merely a foul condition of a well is reported—as for instance such as might be attributable to decaying leaves, dead toads, etc.—but very frequently a second examination is requested to “make certain that the water is now good,” following the cleaning up that should have been done before the first sample was collected.

### *The Dangers of Lead Pipe.*

As in the past, requests for advice as to suitable forms of pipe for carrying water have been numerous. The following is contained in a recently adopted form reply:

“The examination of a supply for the purpose of determining its behavior toward lead pipe is held to be impracticable. As a matter of fact, the installation of lead pipe is uniformly advised against, experience having demonstrated not only that there is almost always some solution of this metal in any case, but that the presence of traces of such in drinking water may be held responsible for certain minor, and rather obscure ailments frequently exhibited by the users.”

The report shows that of 699 examinations made for lead, 346, or approximately 50% showed the presence of considerable amounts of this metal. Nearly all of these samples, however, showed at least some lead, and in addition to the above number, very many more contained sufficient, in the writer's opinion, based upon the repeated statements of physicians, to cause impairment of health. Approximately one-fifth of the total number of private supplies examined were condemned because of their lead content, though of excellent quality in every other way. This involves a condemnation for this reason of 40% of all the waters found organically pure.

In a letter referring to a recent water report (Bulletin, July, 1910) Prof. Edwin J. Bartlett of Dartmouth College, thus expresses his opinion of lead pipe as a water conductor:

"I think you needlessly minimize the danger from lead. You base your percentage on the number of waters examined, whereas it might well be upon the number with lead conductors . . . If I make a correct count, of twenty-two with lead conductors, nineteen showed lead. That corresponds with my own experience that just about all the waters with lead conductors carry the metal, and that lead is an unfit conductor for New Hampshire waters.

"My own belief is that *any* detectable lead is excessive for habitual use, although it is very difficult to prove it. It is very slowly eliminated; its chronic effects are in the alimentary canal, the kidneys, the nervous system and the skin. Very few persons long subjected to a little lead are free from all perversions of the above mentioned functions. As very few persons long subjected to the conditions of life in general are absolutely normal anyway, it is exceedingly difficult to separate lead from other causes. Nevertheless I am very suspicious of it and believe there is no proper line to be drawn between 'lead' and 'excessive lead' in a drinking-water."

Personally, we are in accord with every word of the above. The 0.05 "safety limit" is one that has been generally recognized elsewhere, and it has long been the custom at this laboratory to gauge to some extent by this the quality of a lead-contaminated water, although care has been observed in making reports to state that less than 0.05 parts might very well be objected to as being a not impossible course of impairment of health in the regular user. Nevertheless it has not thus far seemed quite practicable to formally condemn lead-conducted waters carrying but small amounts of lead, this because of the lack of decisive evidence to which Professor Bartlett himself refers. Though theoretically, the only proper course would be to rule absolutely against the use of any dangerous conductor, yet, to be consistent in this would involve a similar contest against a considerable number of substances now used or present in foods in minute amounts—an attack that would be futile at the present time.

#### *Objection to Galvanized Pipe.*

In the report for 1907-08 reference was made to the proneness of our ground waters to dissolve the zinc coating, where galvanized pipe is used; this subject is also mentioned elsewhere in this report (see



elsewhere. While there is still question as to the deleteriousness of small amounts of zinc in drinking water, it is certain that galvanized pipe is not a durable conductor for very many of the well and spring supplies of this state, and for some time we have been receiving inquiries as to a proper substitute. Block tin and tin-lined iron pipe are most desirable forms recommended to those to whom the relatively large expense is not a serious objection.

For the ordinary installation, however, the present evidence is greatly in favor of cement-lined iron—*providing it is properly jointed and laid*,—an early objection to this pipe, based on corrosion at the uncovered joints, being no longer a valid one. Unfortunately, cement-lined pipe is not a regular article of merchandise, it being necessary to secure such through some city or some firm of plumbers having the requisite outfit for applying the lining. The cost of this form of pipe may be roughly estimated at about double that of common galvanized iron.



*Water Supplies of Towns and Cities.**Summary of Examinations, 1908-10, by Towns.*

Town	Private Supplies				Total Excessive Lead		Total Lead Tests		Total Excessive Zinc	Total Private Exams	Total Public Exams	Total Semi-Public Exams
	Pure	Pure but for Lead	Doubtful*	Polluted	Private	Public and Semi-Public	Private	Public and Semi-Public				
Aeworth .....	5	4	5	2	5	0	10	0	0	16	0	0
Alexandria .....	2	0	0	0	0	0	0	0	0	2	0	0
Alstead .....	3	2	1	0	3	0	4	0	0	6	1	0
Alton .....	1	0	0	1	1	0	0	0	0	2	6	0
Andover .....	4	8	7	3	5	0	12	7	3	22	11	1
Amherst .....	0	0	0	3	1	1	2	1	0	3	0	3
Antrim .....	5	1	7	15	4	0	7	0	2	28	7	5
Ashland .....	1	0	1	1	0	0	1	0	0	3	2	2
Auburn .....	1	0	0	3	0	0	2	0	0	4	1	1
Barnstead .....	1	3	1	4	4	0	5	0	1	9	0	0
Barrington .....	0	0	0	1	0	0	0	0	0	1	0	0
Bartlett .....	0	1	0	0	1	0	1	0	0	1	2	0
Bath .....	3	0	1	0	0	0	1	0	0	4	1	0
Bedford .....	1	0	0	5	0	0	1	0	0	6	0	0
Belmont .....	0	0	0	0	0	0	0	0	0	0	2	0
Bennington .....	6	0	1	2	0	0	1	0	0	9	3	0
Benton .....	0	0	0	0	0	0	0	0	0	0	0	1
Berlin .....	3	1	0	1	1	0	1	0	0	5	17	1
Bethlehem .....	3	0	2	1	1	1	5	5	0	6	3	10
Boscawen .....	0	1	0	0	1	0	1	0	1	1	3	1
Bow .....	2	0	2	0	0	0	2	0	0	4	0	0
Bradford .....	1	2	4	5	6	0	9	0	0	12	0	0
Bristol .....	1	4	2	1	5	0	6	0	0	8	2	0
Brookline .....	1	1	1	1	1	0	2	0	0	4	0	1
Campton .....	1	3	1	0	3	0	4	0	0	5	0	0
Canaan .....	2	2	3	2	3	0	4	0	0	9	1	0
Candia .....	2	0	1	1	0	0	0	0	0	4	1	2
Canterbury .....	0	0	0	0	0	0	0	1	0	0	0	3
Center Harbor .....	2	0	1	0	0	0	0	4	0	3	1	14
Charlestown .....	3	1	0	1	2	0	5	0	0	5	5	0

## WATER SUPPLIES OF TOWNS AND CITIES.

*Summary of Examinations, 1908-10, by Towns.—Continued.*

[illegible]

## STATE BOARD OF HEALTH.

*Summary of Examinations, 1908-10, by Towns.—Continued.*

[illegible]

*Summary of Examinations, 1908-10, by Towns.—Continued.*

[illegible]



*Summary of Examinations, 1908-10, by Towns.—Concluded.*

Total	Private Supplies				Total Ex- cessive Lead		Total Lead Tests		Total Excessive Zinc	Total Private Exams	Total Public Exams	Total Semi-Public Exams
	Pure	Pure but for Lead	Doubtful *	Polluted	Private	Public and Semi-Public	Private	Public and Semi-Public				
Tamworth .....	4	0	6	2	0	0	1	0	2	12	0	2
Temple .....	1	0	1	0	0	1	0	1	0	2	0	1
Tilton .....	2	2	4	2	3	0	5	0	0	10	0	2
Troy .....	6	3	10	7	9	0	18	0	0	26	0	0
Tuftonborough .....	0	0	2	0	0	0	0	0	0	2	0	5
Unity .....	1	0	0	1	0	0	0	0	0	2	0	0
Wakefield .....	8	1	4	5	5	0	8	0	0	18	0	0
Walpole .....	3	2	4	2	3	0	4	0	0	11	8	0
Warner .....	11	8	9	3	11	0	15	0	0	31	3	1
Warren .....	4	7	5	1	8	1	11	2	1	17	2	2
Washington .....	1	0	1	0	0	0	0	0	0	2	0	0
Weare .....	4	2	1	0	3	0	4	1	0	7	0	3
Webster .....	1	2	1	0	2	0	4	0	0	4	0	0
Wentworth .....	0	1	1	0	2	0	2	0	0	2	0	0
Wendell .....	0	0	0	0	0	0	0	0	0	0	0	1
Westmoreland .....	0	1	0	0	1	0	1	0	0	1	0	1
Whitefield .....	1	0	0	0	0	0	0	0	0	1	5	0
Wilmot .....	0	0	2	0	1	2	2	4	0	2	0	4
Wilton .....	5	9	1	3	9	0	15	1	1	18	2	2
Winchester .....	1	4	1	1	4	0	5	1	0	7	1	0
Wolfeboro .....	1	0	1	0	0	0	1	0	0	2	1	2
Woodstock .....	1	0	0	0	0	0	0	0	0	1	1	2
Woodsville .....	0	0	0	0	0	0	0	0	0	0	2	0
Totals .....	329	221	311	311	319	27	515	84	49	1172	437	288

The "semi-public" examinations mentioned in the preceding general summary represent analyses of samples collected from sources supplying hotels, factories, schools, railroad stations and other places of public character. The following special summary indicates the results of analyses of samples of water collected from summer hotels and farm resorts during July and August, 1910: (For details of this inspection see special report elsewhere).

\*Denotes not only waters of questionable quality, but probable pure sources requiring attention.



SUMMARY OF WATER SUPPLY INSPECTION OF SUMMER RESORTS,  
JULY-AUGUST, 1910.

Town.	Acceptable.	Non-acceptable.	Excessive lead.	Total supplies examined.
Amherst .....	2	1	1	3
Ashland .....	1	1	0	2
Bethlehem .....	7	2	1	9
Center Harbor .....	6	9	0	15
Conway .....	6	1	1	7
Crawford Notch District .....	6	0	0	6
Franconia .....	3	1	1	4
Hampton .....	4	6	0	10
Hampton Falls .....	2	0	0	2
Holderness .....	10	0	0	10
Jackson .....	5	0	0	5
Laconia .....	5	1	1	6
Lincoln .....	1	0	0	1
Lisbon .....	8	1	1	9
Meredith* .....	3	4	3	7
Moultonborough .....	1	3	0	4
North Hampton .....	2	1	0	3
Ossipee .....	1	3	0	4
Rye .....	5	5	0	10
Sandwich .....	4	2	0	6
Sunapee .....	2	1	0	3
Tamworth .....	1	0	0	1
Tuftonborough .....	1	3	0	4
Wilton .....	1	0	0	1
Wolfeboro .....	3	0	0	3
	—	—	—	—
Totals .....	90	45	9	135
Per cent .....	67	33	6.7	

The details of water-supply examinations by cities and towns are here given. Results represent parts in 100,000. The following is given in explanation of the significance of the analytical figures:

*Odor, Turbidity, Sediment and Color.*—The best ground waters are free from any of these characters. Nevertheless, otherwise perfectly good water may at times show a slight earthy odor, or if the water issues from clay, there may be a slight clayey odor, accompanied by an opalescence. Good ground water may also contain a little earthy sediment. Color should be absent, or but very slight.

*Hardness.*—This will be somewhat greater than is the case with the average surface supply, for the reason that percolation through the soil involves solution of some of the mineral salts therein. In the case of our granitic soils, however, the latter is usually but slight. Unless issuing from limestone strata, any considerable degree of hardness or mineralization occurring in our shallow ground waters is to be attributed to pollution.

\* Including Bear Island.

*Free and Albuminoid Ammonia.*—These factors are representative of the proportion of organic matter. They stand for the degree of active, or present pollution. Good ground water, being soil-filtered, will contain practically none of these elements.

*Chlorine.*—This term is expressive principally of common salt but it is also referable to the other forms of combination of chlorine with lime, magnesia and potash, such as occur both in sea water and in the body secretions. As chlorides are practically absent from New Hampshire soil, the finding of any appreciable quantity in a water is usually indicative of one or two things: (1) nearness to the ocean, or (2) sewage pollution. As the proportion of chlorine as influenced by proximity to the sea is a nearly constant factor and has been charted for any given locality, any quantity in excess of the normal is, when taken in connection with other factors, to be accepted as evidence of pollution. Thus it will be noted that the "normal chlorine" for the region comprising the mountains and beyond is very slight—rarely in excess of one tenth of one part, and generally less, even.

*Nitrates and Nitrites.*—When water subject to pollution and containing in consequence large amounts of nitrogen in the form of ammonia, percolates through the soil, the latter acts as a filter, removing color, organic matter and most of the bacteria. While partly a mechanical process, this filtration is largely bacterial in its operation, the naturally present soil-bacteria serving to oxidize the nitrogen present in the form of ammonia to nitrites and nitrates. If the process has not been complete or thorough, nitrites will be present. Such waters, being but partially purified, are unstable and unsafe. It is very common indeed for the laboratory to receive water the analysis of which, while showing practically no organic matter, does indicate the presence of considerable amounts of nitrates, accompanied usually by high solids, chlorine and hardness.

Though such "purified" (but not "pure") water is possibly fairly safe for drinking, its regular use is to be objected to,—for one reason, that any unusual draught upon the supply, or some other abnormal condition, may result in a disturbance or impairment of the filtering process. Thus it frequently happens with such waters that if the supply be drawn upon to an unusual degree, a disagreeable odor or taste temporarily occurs.

Another objection to the regular use of excessively nitrated waters, especially by children and in certain forms of invalidism, is that nitrate of potash (saltpetre) is to be classed as one of the poisons. When given over a long period of time this drug is said to cause "irritation of the stomach, a slow, weak pulse, and general depression." In large doses it has all the properties of an irritant poison and has been the cause of death. Manifestly, the use of pure water is preferable to the daily copious ingestion of a water charged with this drug, even though the quantity be not so very great.

*Colon (or Intestinal) Bacilli.*—While a test for these bacteria is uniformly made, a positive finding is of significance only when taken in connection with the other data. It is nothing unusual to find these bacilli in unpolluted supplies at times; when, however, their persistent presence is indicated as a result of two or more consecutive examinations it is then high time to investigate their origin and significance. Very frequently the entrance of a little pasture-wash following a shower is responsible; furthermore, it is not a difficult matter to contaminate a water-sample with colon bacilli in the taking. For these reasons, positive findings in samples from a few of the resorts, the supplies of which have otherwise given every evidence of being above sus-

picion, have been accorded no significance,—especially as the examination of samples subsequently taken has generally afforded negative results. In one instance, where the well is located but twelve feet from the privy and the samples have persistently shown the presence of coli, approval of the supply has not been granted, notwithstanding that the analysis in all other respects has been indicative of good water. In another case where a sample taken from a water-bottle at a hotel was found to contain coli, there is some ground for believing that the latter may have been present as a result of handling the bottle with unclean hands. The neglect on the part of hotel employees who have occasion to handle the food supply, to wash the hands following visits to the toilet, is known to have been responsible for at least one outbreak of typhoid fever, as it doubtless has been for numerous others.\*

*Lead and Zinc.*—A favorable report has been denied in the case of supplies, the analysis of which has indicated the presence of as much as 0.050 parts of lead, and the owners have further been informed that they must either substitute some other form of pipe or else abandon the supply. While it seems very probable that in some cases a considerably less quantity than 0.050 parts lead may be capable of causing impairment of health, it has not been deemed advisable to condemn supplies carrying less than this amount.

At present we have practically no reliable information as to the toxic effects of small quantities of zinc in drinking water. While there seems some ground for the belief that quantities in excess of one to two-tenths of one part are capable of exerting an effect upon the regular user of the supply, yet we have thus far had no reliable means of proving this to be the case. Careful clinical observations upon this point are greatly needed. For these reasons, while no supplies have been condemned because of zinc content, the owners have been notified in a number of cases that the proportion of this metal is too great to permit of an unconditional verdict of "pure," and they have been advised to make some changes.

**Allenstown.**—(See Pembroke for analyses of public supply).

### Alstead.

#### *Examination of Water from Stream, Proposed Public Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
5455	1908 July 27	None	S. fine	S. earthy	0.10	3.9	2.5	.0016	.0034	.0100	.0000	.25	1.0	....

\*Bulletin Massachusetts Board of Health, September, 1909.

**Alton.**—The Alton & Alton Bay Water Works Company, established in 1892–93, supplies about 100 families (90 per cent. of the population), with water from a spring, except in dry weather, when it is pumped from Lake Winnepesaukee to a reservoir of 150,000 gallons' capacity.

*Examination of Water from Faucet of Supply of Alton & Alton Bay Water Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
782	1902 Sept. 6	None	S. earthy	None	0.00	7.4	3.5	.0000	.0030	.0220	.0000	.27	3.1	.....
1337	1903 July 16	Slight	Con. fine	S. veg.	0.15	4.7	3.0	.0000	.0000	.0000	.0000	.15	2.6	.....
1936	1904 May 9	Slight	None	V. slight	0.00	5.5	3.0	.0010	.0012	.0050	.0000	.13	2.2	.....
2109	June 28	Slight	None	S. earthy	0.00	7.4	3.8	.0000	.0018	.0000	.0000	.15	3.6	.....
2655	1905 Jan. 23	None	None	S. earthy	0.10	5.8	3.8	.0000	.0014	.0100	.0000	.12	2.2	.....
2965	July 7	Slight	Con. flocc.	S. foul	0.30	5.7	3.7	.0000	.0012	.0000	.0000	.12	2.0	.....
3010	July 24	Slight	Slight	Earthy	0.10	3.3	1.1	.0010	.0070	.0000	.0000	.15	0.4	.....
3023	July 27	V. slight	None	None	0.10	5.3	3.2	.0016	.0028	.0050	.0040	.17	2.4	.... *
3058	Aug. 7	V. slight	Slight	Much veg.	0.60	4.8	2.2	.0000	.0114	.0050	.0000	.17	1.1	.... *
3277	Oct. 31	Sl. opal	V. slight	Much veg.	0.20	4.7	4.2	.0014	.0034	.0180	.0000	.22	2.6	.....
3914	1906 Aug. 29	V. slight	V. slight	None	0.10	2.2	1.2	.0022	.0078	.0100	.0000	.15	0.9	.... *
4155	Nov. 14	None	None	None	0.05	5.3	3.6	.0014	.0034	.0050	.0000	.10	3.2	.....
4404	1907 Apr. 5	None	None	S. veg.	0.13	3.5	1.9	.0016	.0042	.0000	.0000	.15	1.9	.... *
4898	Sept. 24	V. slight	V. slight	None	0.30	3.0	2.0	.0012	.0078	.0000	.0000	.08	1.9	.....
4912	Oct. 2	None	V. slight	V. m. veg.	0.00	9.6	8.0	.0010	.0012	.0300	Ft. tr.	2.51	3.2	.... a
5167	1908 Mar. 13	None	None	S. earthy	0.00	5.0	3.0	.0004	.0040	.0050	.0000	.21	2.6	.....
5831	Nov. 11	None	None	Earthy	0.00	4.0	2.7	.0030	.0055	.0070	.0002	.12	1.5	.....
7519	1909 Dec. 24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.... *
7522	Nov. 19	None	None	Earthy	0.20	4.5	2.5	.0002	.0030	.0100	.0000	.15	1.9	.... *
7709	1910 Mar. 10	None	None	S. earthy	0.00	4.8	2.4	.0004	.0010	.0050	.0000	.19	1.9	.....

\* B. Coli present.  
a Town pump.



*Examination of Water Supplies in Alton Camp Ground.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
3973	1906 Sept. 12	None	V. slight	Veg.	0.1	.....	.....	.0010	.0048	.0050	.0000	.10	1.2	.... a
3985	Sept. 18	None	None	None	0.0	.....	.....	.0006	.0010	.0050	.0000	.60	2.4	.... b

a Tap from spring.

b Camp Ground well.

**Amherst.**—Analyses of samples taken from four spring supplies of public character are here given:

*Examination of Water from Spring Supply of Abby Melendy.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
3093	1905 Aug. 17	None	Slight	S. earthy	0.00	5.5	3.7	.0000	.0000	.0100	.0000	.15	1.5	.070 ..
3504	1906 Mar. 6	None	None	V. slight	0.00	4.5	3.8	.0008	.0044	.0100	.0000	.20	1.1	.....
4910	1907 Oct. 30	None	None	Foul	0.00	3.7	3.2	.0014	.0026	.0050	.0000	.17	1.2	.090 ..

*Examination of Water from Spring Supply of J. C. Taylor.*

3109	1905 Aug. 22	None	Slight	S. foul	0.00	3.6	2.2	.0010	.0020	.0080	.0000	.15	....	.020 ..
3505	1906 Mar. 7	None	None	None	0.00	4.1	2.1	.0008	.0044	.0100	.0000	.20	0.9	.020 ..
5177	1908 Mar. 18	None	None	None	0.00	3.9	2.0	.0002	.0008	.0040	.0000	.19	0.4	.040 ..

*Examination of Water from Spring Supply of Elizabeth Nichols.*

3085	1905 Aug. 15	None	None	None	0.00	5.8	3.0	.0006	.0008	.0000	.0000	.05	1.8	.010 ..
3326	Dec. 6	None	None	None	0.20	6.5	3.9	.0010	.0066	.0050	.0000	.29	0.6	.....

*Examination of Water from Spring Supply of Herbert Belden.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
3273	1905 Oct. 30	None	None	None	0.05	5.3	2.9	.0010	.0016	.0050	.0000	.07	1.6	....

**Andover.**—Water is furnished to about 30 families in Andover Center by C. E. Carr, from three reservoirs supplied by eight springs on the side of Ragged Mountain. The watershed is partly wooded and partly cleared; no inhabitants. The springs are dug from six to fifteen feet deep, and the water flows by gravity through about two miles of mains, one third iron and two-thirds lead pipe. The service pipes also are some lead and some iron. There are many private wells within the area of this supply. A part of the families of West Andover are supplied from springs on the west side of Ragged Mountain. Cilleyville is supplied from private wells. East Andover and all the rest of Andover also from wells, except five families which have water from springs.

*Examination of Water Supplied Andover Center.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
841	1902 Oct. 9	None	Slight	None	0.0	7.0	2.9	.0000	.0000	.0000	.0003	.12	2.2	....
855	Oct. 12	None	None	None	0.0	5.5	3.4	.0000	.0000	.0000	.0000	.12	2.3	....
3078	1905 Aug. 14	None	None	None	0.00	6.4	3.7	.0000	.0010	.0100	.0000	.12	1.9	....
4427	1907 Apr. 9	None	None	None	0.00	2.5	1.8	.0008	.0004	.0100	.0000	.10	1.2	....
7833	1910 Apr. 25	None	S. hair like	None	1.05	3.5	2.1	.0007	.0050	.0050	.0000	.12	1.5	.005
7953	June 9	None	None	S. earthy	0.00	2.4	2.0	.0030	.0010	.0025	.0000	.04	1.2	.025
7970	June 16	None	None	None	0.00	3.0	2.0	.0010	.0010	.0050	.0000	.05	1.2	.012
7971	June 16	None	None	None	0.00	3.3	2.3	.0010	.0020	.0025	.0000	.04	1.2	.012
7972	June 16	None	None	None	0.05	2.1	1.8	.0020	.0010	.0025	.0000	.04	1.2	.012



*Examination of Water from Pond of U. S. Hame Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
7834	1910 Apr. 25	None	V. S. earthy	Veg.	0.10	2.3	.8	.0030	.0090	.0050	.0000	.17	.6	.....

*Examination of Water from Spring of U. S. Hame Company.*

6052	1909 Mar. 24	None	None	S. earthy	0.00	.....	.....	.0003	.0005	.0050	.0000	.05	1.6	.025 ..
------	-----------------	------	------	-----------	------	-------	-------	-------	-------	-------	-------	-----	-----	---------

*Examination of Water from Mud Pond, Proposed Public Supply.*

5738	1908 Sept. 8	V. S. fine	S. Veg.	V. Slight	0.50	3.6	0.5	.0016	.0180	.0050	.0000	.05	.4	.....
5743	Sept. 11	V. faint	S. Veg.	S. marshy	0.45	5.6	2.7	.0065	.0190	.0050	.0000	.05	.6	..... *

\* B. Coli present.

*Examination of Water from Well of Congregational Society.*

8335	1910 Aug. 18	None	V. slight	Earthy	0.00	.....	.....	Very high	.0050	.250	.0000	9.40	10.3	Tr. ..
------	-----------------	------	-----------	--------	------	-------	-------	-----------	-------	------	-------	------	------	--------

**Antrim.**—A water supply was installed by the town in 1893, the source being a pond of about 16 acres in area, and of an average depth of sixteen feet. It is a gravity system, employing three miles of pipe, wooden main, and iron service pipes. Ninety per cent. of the population take this water. (For special report on this supply, see elsewhere.)

*Examination of Water from Tap of Town Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
95	1901 July 30	None	S. floe.	Strong veg.	0.40	3.4	.8	.0000	.0242	.0000	.0000	.11	.....	..
96	July 30	None	Much floe. veg.	Dec. veg. & musty	1.10	4.3	2.2	.0036	.0180	.0000	.0000	.12	.....	*
97	July 30	None	Slight	Dec. musty	0.30	4.5	1.8	.0074	.0150	.0080	.0000	.12	.....	..
98	July 30	None	Slight	Dec. aromat.	0.40	3.2	1.2	.0028	.0184	.0000	.0000	.13	.....	..
177	Sept. 20	None	Slight	Faint veg.	0.25	3.5	.6	.0028	.0180	.0000	.0000	.09	.....	..
178	Sept. 20	None	Slight	Faint veg.	0.25	4.4	.9	.0026	.0180	.0000	.0000	.09	.....	..
1950	1904 June 14	Slight	V. slight	Dec. foul	0.15	2.6	.9	.0000	.0028	.0000	.0000	.05	.9	.....
2663	1905 Jan. 28	None	None	V. S. vg	0.15	4.2	2.3	.0236	.0086	.0200	.0000	.12	1.4	.....
2963	July 7	None	Slight	S. earthy	0.25	2.5	0.8	.0000	.0024	.0000	.0000	.12	0.6	.....
3272	Oct. 31	None	None	None	0.20	3.7	1.3	.0014	.0098	.0050	.0000	.07	0.4	.....
3845	1906 Aug. 15	None	None	None	0.10	2.5	1.0	.0024	.0140	.0050	.0000	.05	0.7	.....
4161	Nov. 15	V. slight	V. slight	Slight	0.10	3.0	1.5	.0016	.0094	.0050	.0000	.05	0.4	.....
4401	1907 Apr. 4	None	V. slight	Musty	0.20	3.5	1.5	.0066	.0060	.0000	V. ft. tr.	.20	1.2	.....
4896	Sept. 25	None	None	None	0.00	1.8	.6	.0002	.0054	.0000	.0000	.07	0.4	.....
5168	1908 Mar. 13	None	None	None	0.10	3.0	1.4	.0150	.0060	.0060	.0000	.26	0.4	.....
5700	Oct. 28	Marked	Con.	Putrid	V. cl-ou- dy	.....	.....	Very high	Very high	.0030	.0000	1.10	1.9	.....
5704	Oct. 29	Marked	Con.	Putrid	Cl-ou- dy	.....	.....	Very high	Very high	.0050	.0000	1.10	1.2	.....
5772	Oct. 20	V. S.	None	None	0.15	1.9	.2	.0035	.0050	.0000	.0000	.10	.2	.....
5805	Oct. 28	V. S.	None	Earthy	0.10	1.7	.6	.0010	.0100	.0000	.0000	.08	.4	.....
6016	1909 Mar. 3	None	None	None	0.10	2.2	1.1	.0140	.0100	.0100	.0000	.11	.4	.....
7711	1910 Mar. 11	None	None	None	0.05	3.9	1.6	High	.0070	.0100	.0000	.20	.7	.....

\* B. Coli present.

*Examination of Water from Well of G. Duncan.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
5701	1908 Sept. 29	None	None	None	0.00	11.0	.....	.0020	.0038	.0600	Ft. tr.	.25	3.1	.....

*Examination of Water from Well of Lyman Tenney.*

5702	1908 Sept. 29	None	None	None	0.05	38.3	.....	.0014	.0052	.1500	Mod- erate	9.20	6.3	..... *
------	------------------	------	------	------	------	------	-------	-------	-------	-------	---------------	------	-----	---------

*Examination of Water from Well of S. G. Wallace.*

5703	1908 Sept. 29	Consid.	S. Iron	Veg.	Con- sid. Cl- oudy	15.8	.....	Very high	Very high	.0750	Hea- vy	1.40	3.8	.....
------	------------------	---------	---------	------	-----------------------------	------	-------	--------------	--------------	-------	------------	------	-----	-------

*Examination of Water from Well of N. C. Jameson.*

5705	1908 Sept. 29	None	None	None	0.00	.....	.....	.0104	.0036	.0750	.0000	.80	2.0	.....
------	------------------	------	------	------	------	-------	-------	-------	-------	-------	-------	-----	-----	-------

*Examination of Water from Spring beside Highway.*

5718	1908 Oct. 4	None	None	None	0.00	3.5	.....	.0040	.0012	.0500	.0000	.20	1.2	..... *
------	----------------	------	------	------	------	-----	-------	-------	-------	-------	-------	-----	-----	---------

\* B. Coli present.

**Ashland.**—The town operates a public water supply derived from a pond.

*Examination of Water from Tap of Town Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
840	Oct. 9	None	None	Veg.	0.25	6.5	1.0	.0000	.0064	.0000	.0000	.07	1.00	....
1426	1903 Aug. 10	None	V. slight	Dec. vg	0.30	7.4	2.1	.0000	.0084	.0000	.0000	.07	1.60	....
1943	1904 May 9	None	None	None	0.15	4.0	1.1	.0000	.0014	.0000	.0000	.15	1.10	.... *
2659	1905 Jan. 24	None	None	V.S. veg	0.10	5.5	1.7	.0054	.0054	.0050	.0000	.12	0.7	....
2964	July 6	None	None	None	0.25	3.5	1.7	.0000	.0104	.0000	.0000	.07	0.7	.... *
3274	Oct. 31	None	None	S. veg.	0.20	3.4	2.0	.0014	.0060	.0050	.0000	.07	0.7	....
3847	1906 Aug. 15	V. slight	V. slight	Slight	0.30	3.8	1.7	.0018	.0134	.0050	.0000	.07	1.2	....
4151	Nov. 13	V. slight	V. slight	Sl. veg.	0.20	4.5	2.1	.0014	.0064	.0050	.0000	.07	1.2	....
4162	Nov. 15	Slight <sup>opal</sup>	Consid. floc.	Sl. veg.	0.20	4.0	....	.0030	.0264	.0050	.0000	.07	1.2	....
4403	1907 Apr. 15	Slight	Slight	M. veg.	0.15	3.2	1.4	.0026	.0068	.0200	.0000	.06	0.9	.... *
4930	Oct. 7	None	None	None	0.50	5.0	3.1	.0046	.0104	.0040	.0000	.14	1.9	....
5138	1908 Feb. 19	None	None	Sl. woody	0.20	3.7	2.3	.0012	.0076	.0100	.0000	.25	1.2	....
5175	Mar. 18	None	None	Sl. earthy	0.20	1.7	1.0	.0004	.0048	.0060	.0000	.19	0.4	....
5847	Nov. 18	None	None	S. earthy	0.10	2.9	1.3	.0020	.0050	.0000	.0000	.08	.4	....
7716	1910 Mar. 15	None	None	S. earthy	0.05	3.1	1.6	.0008	.0078	.0020	.0000	.17	.9	....

\* B. Coli present.

*Examination of Water from Harvard Camp (Spring).*

8211	1910 July 27	None	None	None	0.05	.....	.....	.0005	.0005	.005	.0000	.05	2.6	....
------	-----------------	------	------	------	------	-------	-------	-------	-------	------	-------	-----	-----	------

*Examination of Water from Harvard Camp (Pumping Station).*

8215	1910 July 27	Slight	Mod. ferrug	Mark'd veg.	0.20	.....	.....	.0030	.0070	.0050	.0000	.40	2.6	....
------	-----------------	--------	-------------	-------------	------	-------	-------	-------	-------	-------	-------	-----	-----	------

**Auburn.**—No public water supply. There is one private supply from which seven families are furnished, and one public watering trough for the town.

*Examination of Water from Well Supplying Auburn.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
3027	1905 July 27	None	None	None	0.00	4.9	3.2	.0014	.0014	.0000	.0000	.25	1.6	.....
3280	Nov. 1	None	S.ferrug.	S. earthy	0.05	3.0	1.0	.0014	.0024	.0050	.0000	.30	0.9	..... *
3851	1906 Aug. 16	Consid. ferrug.	S.ferrug.	Earthy	0.08	4.1	3.4	.0040	.0028	.0100	.0001	.40	2.3	.....
4163	Nov. 15	Sl. opal	Slight	M. veg.	0.50	6.0	3.4	.0010	.0134	.0050	.0000	.07	1.2	.....
4410	1907 Apr. 8	Mod.	Mod. ferrug.	Slight	0.40	2.2	1.5	.0006	.0072	.0050	.0000	.28	1.2	.....
5173	1908 Mar. 18	None	V. slight	S. earthy	0.20	2.2	.9	.0002	.0026	.0060	.0000	.37	0.4	.....
5838	Nov. 16	None	None	None	0.00	5.8	3.5	.0010	.0020	.3000	.0002	.25	1.5	.....

\* B. Coli present.

*Examination of Water from Well of Congregational Church.*

7610	1910 Jan. 20	None	Slight	None	0.05	.....	.....	.0010	.0008	.0200	trace	2.40	3.9	.....
------	-----------------	------	--------	------	------	-------	-------	-------	-------	-------	-------	------	-----	-------

**Bartlett.**—The public water supply, owned by the village precinct, was installed about the year 1888 by the Bartlett Water Company. The source is a stream having a watershed of two square miles, wooded land, no inhabitants.

*Examination of Water from Tap of Bartlett Water Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
880	1902 Oct. 21	None	None	V.S.vg.	0.01	4.9	.8	.0000	.0020	.0000	.0000	.07	.6	....
1339	1903 July 15	None	None	S. veg.	0.15	5.3	1.2	.0000	.0020	.0000	.0000	.10	0.9	....
1991	1904 May 24	None	None	V. slight	0.05	5.4	1.9	.0000	.0014	.0000	.0000	.05	1.2	....
2677	1905 Jan. 31	None	None	None	0.00	5.0	2.6	.0000	.0000	.0000	.0000	.10	1.1	....
2978	July 11	None	V. slight	None	0.12	4.0	2.0	.0006	.0006	.0000	.0000	.05	0.7	....
3286	Nov. 9	None	V. slight	None	0.15	2.7	2.0	.0010	.0048	.0050	.0000	.10	0.3	....
3852	1906 Aug. 16	None	V. slight	None	0.08	4.0	2.9	.0010	.0080	.0050	.0000	.12	1.0	....
4179	Nov. 21	None	None	None	0.10	3.5	1.9	.0008	.0048	.0050	.0000	.05	0.4	....
4428	1907 Apr. 10	None	None	None	0.12	2.5	1.9	.0008	.0014	.0050	.0000	.05	0.9	....
4928	Oct. 7	None	None	None	0.05	2.3	.8	.0010	.0022	.0040	.0000	.10	0.4	....
5201	1908 Apr. 1	None	V. slight	Earthy	0.05	3.7	1.5	.0002	.0018	.0200	.0000	.11	0.4	....
5428	July 20	None	Consid. flocc.	Earthy	0.05	3.3	2.5	.0014	.0026	.0100	.0000	.07	0.4	.... <i>a</i>
5429	July 20	V. slight	Consid. flocc.	S. earthy	0.05	2.8	2.0	.0012	.0008	.0080	.0000	.08	0.4	.... <i>*b</i>
5836	Nov. 13	None	Slight	None	0.20	1.9	1.2	.0005	.0010	.0000	.0000	.06	.10	....
7733	1910 Mar. 17	None	None	None	0.20	2.5	1.3	.0006	.0036	.0060	.0000	.10	.30	....

\* B. Coli present.

*a* South Branch, Albany Brook.

*b* East Branch, Albany Brook.



**Bath.**—Water is supplied by two private companies, from springs, dug in a clay soil. The water runs by force of gravity, with about two miles of iron main and service pipes. There are 12 or 15 wells within the area supplied.

*Examination of Water from Faucet of Bath Aqueduct Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
802	1902 Sept. 13	None	None	None	0.00	7.3	3.6	.0000	.0014	.0150	.0002	.15	3.6	.....
2999	1905 July 20	None	Slight	S. earthy	0.05	6.2	4.9	.0000	.0014	.0200	.0000	.15	3.2	..... *
4418	1907 Apr. 9	None	None	Slight	0.00	10.5	7.6	.0008	.0004	.0000	.0000	.25	5.3	.....
4906	1907 Sept. 30	None	S. earthy	S. earthy	0.05	.....	.....	.0002	.0010	.0050	.0000	.26	5.3	.....
5180	1908 Mar. 20	None	None	None	0.05	6.1	3.5	.0010	.0010	.0300	.0000	.29	3.2	.....
7757	1910 Mar. 28	None	None	None	0.05	7.5	4.8	.0010	.0046	.0020	.0000	.16	.4	..... †

\* B. Coli present.

† Trace zinc.

**Belmont.**—The Belmont Water Works, owned by the town, were installed in 1893. Water is obtained from wells, supplemented by a steam in dry seasons. There is a pumping station for use in dry seasons, by which water is pumped from a stream to the reservoir. There is also a private supply in the town. The pipes are of wood mains, and galvanized iron service.

*Examination of Water from Tap of Belmont Water Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
864	1902 Oct. 15	None	None	None	0.00	5.6	3.0	.0000	.0030	.0000	.0000	.12	3.0	....
1327	1903 July 13	Slight	Slight	Dec. foul	0.05	5.1	2.6	.0014	.0012	.0300	.0000	.25	1.2	.... a
1328	July 13	None	None	V. slight	0.05	4.6	2.0	.0000	.0010	.0300	.0000	.20	1.5	....
1329	July 13	None	None	None	0.05	4.3	2.9	.0000	.0000	.0150	.0000	.20	1.2	....
1931	1904 May 7	None	None	Slight	0.00	2.5	.9	.0008	.0034	.0000	.0000	.125	.7	....
2162	July 18	None	None	None	0.10	3.2	2.1	.0000	.0000	.0000	.0000	.075	1.9	....
2481	Oct. 25	None	V. S. fine	S. veg.	0.30	4.3	2.3	.0000	.0014	.0000	.0000	.10	1.8	....
2482	Oct. 25	None	Con. floe.	V. slight	0.00	3.3	2.0	.0000	.0000	.0000	.0000	.07	1.9	....
2518	Nov. 7	None	Con. floe.	Dec. vg.	0.25	4.6	2.7	.0010	.0058	.0000	.0000	.12	1.9	.... a*
2560	Nov. 28	None	None	None	0.10	4.0	3.2	.0000	.0000	.0000	.0000	.17	0.9	....
2657	1905 Jan. 23	None	None	Slight	0.20	4.4	2.7	.0000	.0000	.0100	.0000	.15	0.7	....
2986	July 17	None	None	Slight	0.20	4.5	2.7	.0000	.0010	.0100	.0000	.15	0.7	.... *
3279	Nov. 1	None	V. slight	Veg.	0.20	5.1	3.6	.0014	.0058	.0050	.0000	.22	0.7	....
3636	1906 May 24	None	V. slight	S. veg.	0.25	4.8	2.6	.0010	.0060	.0100	.0000	.10	....	.... *
3651	May 30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.... *
3856	Aug. 17	None	V. slight	None	0.20	5.0	2.7	.0010	.0044	.0050	.0000	.10	1.1	....
4158	Nov. 14	V.S. opal	Slight	Veg.	0.15	6.0	3.5	.0014	.0042	.0050	.0000	.05	1.2	....
4416	1907 Apr. 8	None	None	Earthy	0.15	2.4	1.5	.0012	.0026	.0100	.0000	.17	0.9	....
4907	Sept. 30	None	None	None	0.35	4.3	2.8	.0012	.0104	.0050	.0000	.32	1.2	.... *
5189	1908 Mar. 25	Consid.	M. earthy	Slight	0.40	3.0	1.5	.0002	.0114	.0020	.0000	.12	0.4	....
5828	Nov. 5	None	None	None	0.15	2.3	1.3	.0005	.0030	.010	.0000	.11	.9	....
7720	1910 May 15	None	None	None	0.00	2.6	2.3	.0004	.0040	.005	.0000	.19	.9	....

a Stream at pumping station. The quality of this water varies according to the use of the auxiliary stream supply.

\* Colon B. present.

**Bennington.**—No public supply. The Bennington Water Works Company, a private company, in 1900 installed a system supplied from springs, with a supplementary supply from a stream.

*Examination of Water from a Faucet of the Bennington Water Works Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
751	1902 Aug. 27	None	V. slight	None	0.15	6.5	2.8	.0000	.0000	.0000	.0000	.10	1.5	....
1334	1903 July 15	None	None	V. slight	0.10	3.7	2.3	.0000	.0030	.0000	.0000	.05	1.5	....
341	1903 July 16	None	None	Veg.	0.10	3.4	2.7	.0000	.0034	.0000	.0000	.05	2.0	....
2262	1904 Aug. 9	Very marked	Much flocc. red	None	0.60	6.1	1.7	.0000	.0034	.0050	.0000	.10	1.4	.... *
3069	1905 Aug. 9	None	Slight	S. earthy	0.05	4.5	2.3	.0000	.0026	.0050	.0000	.10	1.2	....
3287	1905 Nov. 8	None	None	None	0.00	5.4	3.9	.0010	.0044	.0050	.0000	.12	0.9	....
3885	1906 Aug. 23	None	None	Slight	0.05	4.2	3.6	.0010	.0032	.0050	.0000	.12	1.5	....
3960	1906 Sept. 11	None	Ferrug.	.....	0.10	6.6	4.7	.0014	.0060	.0000	.0000	.20	1.1	....
3961	1906 Sept. 11	V. slight	V. slight	Veg.	0.10	5.2	2.1	.0008	.0110	.0000	.0000	.05	1.1	.... †
4925	1907 Oct. 6	Mod. slight	Slight	S. earthy	0.40	5.0	2.9	.0020	.0130	.0060	.0000	.88	1.9	....
5182	1908 Mar. 23	V. slight	Slight	None	0.05	5.7	2.5	.0024	.0018	.0080	.0000	.11	0.4	.... *
5841	1908 Nov. 16	None	V. slight	Earthy	0.10	3.8	2.4	.0008	.0015	.0100	.0000	.15	.7	....
7139	1909 June 28	S. coarse	S. coarse	None	0.00	.....	.....	.0015	.0015	.0050	.0000	.05	.9	....
7746	1910 Mar. 22	Slight	Mod. earthy	Earthy	0.10	4.2	1.6	.0014	.0054	.0020	.0000	.41	1.2	....

\* Colon B. present.

† Reservoir.

**Benton.**

*Examination of Water from Stream Used as a Supply by Camp 4, Champlain Realty Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
7508	1909 Nov. 7	None	None	None	0.05	.....	.....	.0010	.0015	.0750	.0000	.10	0.4	.....

**Berlin.**—There are two private supplies, the Berlin Water Company, established in 1892, and the A. B. Forbush supply (1905). The latter consists of springs dug ten feet deep and supplies about twenty families on the east side of the Androscoggin River. This supply is apt to go dry during the summer.

The Berlin Water Company derives its supply from a stream with a wooded and uninhabited watershed of three and one-half square miles. There are three reservoirs supplied by gravity, known respectively as the Bean Brook (3,000,000 gallons), the Anderson (10,000,000 gallons) and the Stewart (2,500,000 gallons). Twenty-one miles of cast iron distributing pipe with about 1,200 services (galvanized) supplying practically the whole population. During 1909, for use in times of drought, and for increasing the fire protection of the city, the Berlin Water Company installed a two-stage D'Olier pump at the Burgess Sulphite Fibre Company's plant. The water passes through sand filters and is supplied to the filters from the Androscoggin River by a pump of about 1,500 gallons capacity per minute, with eighty pounds pressure.

Quite a number of the inhabitants at Berlin Mills are supplied from wells, the water of which flows to the dwellings by gravity.

*Examination of Water from Berlin Water Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
843	1902 Oct. 9	None	None	V. slight	0.75	6.5	1.4	.0000	.0112	.0000	.0000	.05	1.4	....
1061	1903 Feb. 22	None	None	None	0.00	12.3	6.6	.0000	.0000	.0150	.0000	.07	2.0	....
1326	July 13	None	None	V. slight	0.65	4.6	1.8	.0000	.0104	.0000	.0000	.05	0.7	....
1491	Sept. 3	None	None	V. slight	0.40	3.6	1.4	.0000	.0044	.0000	.0000	.07	1.1	....
1828	1904 Feb. 1	Slight	M. fine	V. slight	0.00	9.8	7.2	.0016	.0008	.0000	.0000	.10	5.8	.... <i>l</i>
2179	July 20	None	None	None	0.00	12.4	9.3	.0000	.0000	.0200	.0000	.35	7.4	....
2383	Sept. 16	None	Slight	None	1.10	8.0	2.6	.0006	.0166	.0700	.0000	.05	1.4	....
2680	1905 Feb. 4	None	None	V. slight	0.25	4.8	2.4	.0000	.0000	.0150	.0000	.05	0.6	....
3117	Aug. 25	None	S. floe.	Veg.	.25	4.0	1.8	.0008	.0072	.0050	trace	.05	....	.... <i>*a</i>
3118	Aug. 25	None	None	None	0.05	5.4	2.7	.0006	.0026	.0450	.0000	.07	....	.... <i>*b</i>
3389	1906 Jan. 10	None	None	S. veg.	0.20	6.3	3.3	.0008	.0040	.0250	.0000	.07	1.2	....
3562	Apr. 20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.... <i>*c</i>
3565	Apr. 23	V. slight	None	S. veg.	0.05	20.5	14.8	.0086	.0084	.3000	.0005	2.00	5.4	.... <i>*d</i>
3566	Apr. 23	V. slight	V. slight	M. veg.	0.05	8.5	4.0	.0136	.0154	.0100	.0000	0.10	1.6	.... <i>*e</i>
3567	Apr. 23	None	None	Slight	0.20	7.5	3.5	.0020	.0080	.0100	.0000	0.10	1.8	.... <i>*f</i>
3568	Apr. 23	Slight	S. floe.	M. veg.	0.60	7.8	4.2	.0006	.0134	.0100	.0000	.07	1.6	....
3571	Apr. 23	None	V. slight	.....	0.40	6.8	4.5	.0034	.0110	.0100	.0000	.05	1.4	.... <i>*g</i>
3573	Apr. 25	None	None	None	0.20	4.7	2.7	.0010	.0070	.0750	.0000	.05	0.6	.... <i>h</i>
3574	Apr. 25	None	V. slight	S. veg.	0.05	4.2	2.0	.0014	.0074	.0100	.0000	.05	0.3	.... <i>i</i>
3659	June 5	None	None	None	0.00	5.1	3.5	.0012	.0014	.0150	.0000	.10	1.4	....
3660	June 5	V. slight	None	Slight	0.00	5.6	4.2	.0012	.0028	.0050	.0000	.10	....	.... <i>b</i>
3661	June 5	V. slight	V. slight	S. veg.	0.50	4.6	2.2	.0022	.0064	.0050	.0000	.07	0.6	.... <i>i</i>
3662	June 5	None	None	V.S.vg.	0.30	5.0	2.8	.0008	.0050	.0000	.0050	.05	1.4	.... <i>j</i>

\* Colon B. present; *a* Bean and Horn brooks; *b* Cold Spring; *c* represents five samples, taken from St. Giles aqueduct, Green Street aqueduct, Western Avenue aqueduct, Berlin Mills aqueduct, East Side aqueduct, all show Colon B.; *d* Brown and Main Streets spring; *e* Damars reservoir; *f* Stahl reservoir; *g* East Side reservoir; *h* Horn Brook; *i* Bean Brook; *j* Green Spring; *l* artesian well of Water Company.



*Examination of Water from Berlin Water Company—Concluded.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
4318	1907 Jan. 31	None	None	None	0.25	.....	.....	.0016	.0054	.0250	.0000	.15	1.1	.....
4319	Jan. 30	None	None	Veg.	0.25	.....	.....	.0026	.0046	.0250	.0000	.12	1.2	.....
4406	Apr. 5	None	V. slight	S. musty	0.38	4.9	2.8	.0010	.0104	.0250	.0000	.05	2.0	.....
5163	1908 Mar. 9	None	None	None	0.25	3.2	1.3	.0008	.0050	.0250	.0000	.07	1.2	.....
5234	Apr. 15	V. slight	V. slight	None	0.55	3.7	1.4	.0004	.0054	.0120	.0000	.04	0.4	.....
5247	Apr. 22	Mod. opal	Heavy earthy	S. earthy	Cl-oudy	12.0	10.0	.0002	.0010	.0040	.0000	.37	1.5	.....
5678	Sept. 23	V. slight	Slight	Earthy	0.05	4.7	2.0	.0002	.0054	.0050	.0000	.08	.4	..... *
5679	Sept. 23	V. slight	V. slight	Rank	0.05	5.1	2.6	.0008	.0060	.0060	.0000	.07	.4	..... *
5680	Sept. 23	V. slight	Slight	Slight	0.05	5.7	2.8	.0002	.0030	.0060	.0000	.10	.4	..... *
5722	Oct. 5	None	V. slight	None	0.05	5.3	2.5	.0030	.0090	.0050	.0000	.05	.4	.....
5751	Oct. 13	None	V. slight	Musty	0.25	2.9	2.0	.0018	.0060	.0070	.0000	.15	.3	.....
5723	Oct. 5	None	Slight	None	0.20	3.0	1.5	.0020	.0730	.0050	.0000	.05	.3	..... *k
5724	Oct. 5	None	None	None	0.05	5.0	.....	.0008	.0006	.005	.000	.16	.9	..... b
5790	Oct. 22	None	None	None	0.25	3.2	1.7	.0002	.0015	.0090	.0000	.12	.9	.....
5827	Nov. 6	V. slight	None	S. musty	0.35	5.1	3.1	.0010	.0000	.015	.000	.09	.7	.....
6034	1909 Mar. 16	None	V. slight	S. earthy	0.30	.5	.....	.0005	.0030	.030	.000	.05	.7	.....
6069	Mar. 31	None	None	None	0.40	4.7	2.3	.0005	.0070	.020	.000	.06	1.1	.....
6070	Mar. 31	None	None	None	0.40	4.6	2.5	.0008	.0060	.020	.000	.05	.9	.....
7370	Sept. 22	V. slight	V. slight	None	0.20	4.0	2.0	.0010	.0060	.005	.000	.08	.6	.....
7374	Sept. 22	Slight	S. flocc.	None	0.30	3.8	1.5	.0030	.0100	.005	.000	.07	.7	.....
7726	1910 Mar. 15	None	None	None	0.40	3.5	1.9	.0004	.0068	.004	.000	.14	1.1	.....
8132	July 15	None	V. slight	None	0.35	.....	.....	.0038	.0064	.005	.000	.10	1.4	.....

\* Colon B. present.      b Cold Spring.      k Androscoggin River at intake pipe.

*Examination of Water from Spring of Burgess Sulphite Fibre Company.*

5544	1908 Aug. 26	None	None	None	0.05	9.7	6.3	.0006	.0024	.1000	.0000	1.00	3.2	.....
------	-----------------	------	------	------	------	-----	-----	-------	-------	-------	-------	------	-----	-------



*Examination of Filtered River Water of the Burgess Sulphite Fibre Company's Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
5545	1908 Aug. 21	None	V. slight	Slight	0.40	4.8	1.9	.0004	.0054	.0020	.0000	.15	1.2	.....
1031	1909 Mar. 16	None	V. slight	S. earthy	0.30	.....	.....	.0008	.0035	.020	.000	.07	1.8	.....

*Burgess Sulphite Fibre Company, Artesian Well.*

8103	1910 July 9	Slight	S. flocc.	None	0.55	.....	.....	.0036	.0025	.0025	trace	.60	12.4	.....
------	----------------	--------	-----------	------	------	-------	-------	-------	-------	-------	-------	-----	------	-------

**Bethlehem.**—The precinct supply, completed in 1898, is from a stream. The watershed is wooded several miles each side. The water is delivered by gravity through about twelve miles of iron service and main pipes. Ninety-eight per cent. of the population take this water.

*Examination of Water Supplied by the Crystal Springs Water Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
347	1902 Jan. 3	Slight	Slight vg and min	Earthy veg.	0.20	5.3	3.8	.0074	.0076	.0400	.0000	.06	1.6	....
2998	1905 July 19	None	None	Slight	0.05	3.5	2.2	.0000	.0020	.0100	.0000	.05	1.5	....
3360	1906 Jan. 3	None	None	None	0.00	3.9	1.7	.0006	.0022	.0300	.0000	.05	1.4	....
3883	Aug. 22	None	V. slight	S. foul	0.20	4.0	1.5	.0008	.0024	.0100	.0000	.05	0.4	....
4184	Nov. 21	None	None	None	0.20	2.0	1.0	.0010	.0044	.0200	.0000	.15	0.4	....
4415	1907 Apr. 8	None	None	S. veg.	0.13	3.4	1.7	.0004	.0044	.0100	.0000	.07	1.6	....
4991	Oct. 31	None	None	None	0.30	3.3	1.5	.0010	.0054	.0100	.0000	.08	0.4	....
5176	1908 Mar. 18	None	None	None	0.10	2.3	.8	.0002	.0014	.0100	.0000	.08	0.4	....
5832	Nov. 11	V. slight	None	None	0.10	2.5	1.5	.0002	.0015	.010	.000	.03	0.1	....
7728	1910 Mar. 16	None	None	None	0.10	3.5	.7	.0060	.0030	.005	.0000	.05	.4	....
8099	July 6	None	V. slight	None	0.05	.....	.....	.0015	.0010	.0025	.0000	.05	.4	....

**Boscawen.**—Water is from the public supply, Penacook & Boscawen Water Precinct, constructed in 1892. The source is a pond of 340 acres; greatest depth, 36 feet; soil, largely gravel. The watershed is nearly seven square miles, both wooded and cleared. There are five or six houses on the shores of the pond. It is a gravity system, through thirteen miles of wooden and galvanized iron pipe. About two hundred families are supplied.

*Examination of Water from Tap of Penacook & Boscawen Water Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
789	1902 Sept. 9	None	None	S. veg.	0.45	10.10	1.80	.0000	.0142	.0000	.0000	.11	1.5	.....
1944	1904 May 9	V. slight	Slight	Dec. veg.	0.3	4.20	1.70	.0000	.0032	.0000	.0000	.15	1.6	.....
2690	1905 Feb. 9	None	None	None	0.25	6.4	2.4	.0000	.0010	.0000	.0000	.10	0.9	.....
3096	Aug. 18	Consid.	Slight	Earthy	0.30	4.9	1.9	.0000	.0140	.0100	.0000	.17	1.1	..... *
3194	1906 Jan. 13	None	None	S. veg.	0.50	5.0	2.5	.0024	.0084	.0100	.0000	.17	1.1	.....
3860	Aug. 18	.....	.....	.....	0.40	5.3	2.9	.0028	.0114	.0050	.0000	.07	1.4	.....
4171	Nov. 20	None	V. slight	Earthy	0.30	5.0	3.0	.0040	.0094	.0300	.0000	.10	1.2	.....
4440	1907 Apr. 16	Sl. opal	Slight	Woody	0.30	6.5	2.4	.0008	.0086	.0040	.0000	.07	1.2	.....
4957	Oct. 15	V.S. opal	None	None	0.50	5.5	2.8	.0010	.0108	.0100	.0000	.14	0.4	.....
5198	1908 Mar. 30	None	V. slight	S. veg.	0.40	2.7	1.7	.0002	.0068	.015	.0000	.20	1.2	.....
5865	Nov. 26	None	None	Earthy	0.20	2.5	1.8	.0001	.0085	.0000	.0000	.07	.4	.....
7516	1909 Nov. 16	None	None	S. earthy	0.10	3.0	1.0	.0005	.0090	.0050	.0000	.05	.9	.....
7744	1910 Mar. 22	Mod.	S. fibr.	Swam- py	0.20	3.7	2.7	.0004	.0094	.012	.0000	.22	1.5	.....

\* Colon B. present.

*Examination of Water from a Spring at North Boscawen, Owned by Boston & Maine Railroad.*

7062	1909 May 24	None	None	Mod. foul	0.20	.....	.....	.0010	.0020	.030	.0000	.10	.9	..... †
------	----------------	------	------	--------------	------	-------	-------	-------	-------	------	-------	-----	----	---------

† .6 Zinc.

**Bradford.***Examination of Water from Lake Massasecum.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
3749	1906 July 12	V. slight	S. veg.	None	0.2	4.2	1.8	.0028	.0154	.0030	.0000	.07	0.6	.....

**Bristol.**—Bristol Aqueduct Company, incorporated in 1886, supplies water from Newfound Lake, the area of which is about nine square miles. The watershed is largely wooded, some cleared land. It is a gravity system, with about six miles of pipe, mostly cement, but some cast iron mains, and galvanized iron, lead and tin-lined service pipes. About three-fourths of the population of the village use the aqueduct water, while there are a few wells, mostly located back on the hills, away from buildings.

*Examination of Water from a Faucet of the Bristol Aqueduct Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
747	1902 Aug. 26	None	V. slight	S. veg.	0.15	3.90	1.50	.0016	.0050	.0000	.0000	.06	.4	...
1321	1903 July 13	V. slight	Slight	Dec. veg.	0.1	3.00	.90	.0028	.0044	.0000	.0000	.075	1.2	...
1945	1904 May 5	Slight	None	S. veg.	0.1	4.20	1.80	.0000	.0014	.0000	.0000	.075	1.5	...
2664	1905 Jan. 30	None	None	S. veg.	0.15	4.2	2.1	.0000	.0014	.0050	.0000	.10	0.6	...
2998	July 18	None	None	Veg.	0.10	3.9	1.9	.0000	.0024	.0000	.0000	.12	0.9	...
3351	1906 Jan. 2	None	V. slight	S. veg.	0.10	2.5	1.1	.0014	.0066	.0050	.0000	.07	0.7	...
3853	Aug. 17	None	V. slight	Veg.	0.10	4.1	2.2	.0014	.0070	.0050	.0000	.15	0.4	...
4170	Nov. 20	None	None	None	0.10	4.0	2.5	.0010	.0044	.0050	.0000	.07	0.4	...
4417	1907 Apr. 9	None	None	None	0.13	2.8	2.4	.0010	.0030	.0050	.0000	.14	0.4	...
4909	Oct. 30	None	None	None	0.05	2.4	1.8	.0014	.0048	.0050	.0000	.05	0.9	.015
5174	1908 Mar. 16	None	None	S. earthy	0.15	2.9	1.7	.0020	.0030	.0040	.0000	.16	0.4	...
5856	Nov. 25	None	None	None	0.10	2.6	1.7	.0010	.0030	None	.0003	.08	.4	...
7717	1910 Mar. 15	None	V. slight	Slightly swam-py	0.05	2.5	1.1	.0012	.0060	.004	.0000	.12	.4	...

\* B. Coli present.

**Brookline.**—No public supply. A well on the east side of the town is the source of the fountain and faucet in public square.

*Examination of Water from Public Fountain Supplied by a Well.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
327	1901 Dec. 10	None	None	S. foul	0.0	9.30	7.00	.0000	.0076	.1250	.0002	.80	2.00	...

*Examination of Water from Well Supplying Congregational Society.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
8102	1910 July 13	None	None	None	.10	.....	.....	.0012	.0020	.075	trace	.70	1.9	.....

**Canaan.**—No public supply. A private supply from Hart's Pond was introduced by the Crystal Lake Water Company in 1891.

*Examination of Water from Crystal Lake Water Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
868	1902 Oct. 16	Marked	M. floe.	Dec. veg.	0.2	5.50	2.10	.0000	.0168	.0000	.0000	.07	2.0	.....
3026	1905 July 28	V. slight	Slight	Earthy	0.20	4.8	2.0	.0022	.0080	.0050	.0000	.12	1.2	.....
3510	1906 Mar. 6	None	None	None	0.10	5.3	3.0	.0014	.0074	.0050	.0000	.05	1.4	..... *
4087	Oct. 22	None	V. slight	Musty	0.05	6.2	4.5	.0010	.0060	.0050	.0000	.05	1.2	.....
4432	1907 Apr. 12	V. slight	Slight	V. slight	0.15	2.5	1.2	.0026	.0108	.0080	.0000	.12	1.2	.....
5235	1908 Apr. 15	V. slight	Slight	Sl. veg.	0.15	3.8	1.5	.0006	.0078	.0100	.0000	.10	1.2	.....
7885	1910 May 13	Slight	Sl. floe.	Mark earthy	0.20	2.7	1.4	.0015	.0135	.0054	.0000	.10	1.1	.....

\* B. Coli present.

**Candia.**—There are two private supplies, the John H. Holt and the D. H. Baker, each built in 1893. The first is from an artesian well 100 feet deep, pumped by windmill to a reservoir of 7,000 gallons' capacity, 10 feet diameter and 12 feet deep. This supplies 16 houses and two shoe shops.

The Baker supply is from a spring about eight feet square and six feet deep, boxed up with plank and covered by a shed roof. This



water is also pumped by a windmill to a reservoir of 3,000 gallons' capacity, eight feet diameter and eight feet deep. This system furnishes water to five houses.

Both systems deliver through about one-fourth mile of galvanized pipe, main and service.

There are two public wells, one at Candia Village and one at Candia Depot.

*Examination of Water from Supply of John A. Holt, East Candia.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
869	1902 Oct. 16	None	None	None	0.0	14.10	10.6	.0000	.0000	.4800	.0000	1.45	4.7	.....
2733	1905 Mar. 2	None	None	None	11.2	11.2	8.0	.0000	.0000	.3000	.0000	1.40	3.9	.....
3033	Aug. 1	Slight	Slight	S. earthy	0.15	16.8	9.8	.0000	.0000	.3000	.0000	1.67	5.2	.....
3371	1906 Jan. 5	V. slight	V. slight	S. foul	0.00	16.7	11.3	.0024	.0038	.5000	.0003	1.95	6.0	.....
3908	Aug. 27	None	V. slight	None	0.10	15.6	8.8	.0010	.0024	.1000	.0000	2.40	4.7	.....
4194	Nov. 28	None	None	None	0.05	19.0	13.5	.0010	.0014	.5000	.0000	2.25	5.6	.4160
7748	1910 Mar. 24	V. slight	V. slight	None	No	25.6	22.3	.0010	.0030	.200	.002	4.14	8.4	.....

*Examination of Water from Supply of D. H. Baker.*

4437	1907 Apr. 15	V. slight opal	Sl. coarse	Slight	0.00	6.3	4.0	.0014	.0026	.0300	.0000	.38	1.9	.....
4929	Oct. 7	None	V. slight	None	0.00	9.3	7.5	.0002	.0022	.0050	.0000	.31	2.3	.....

*Examination of Water from Well of Free Baptist Church Society.*

5991	1909 Feb. 16	None	None	None	0.00	.....	.....	.0020	.0060	.200	.0016	9.4	7.7	.....
------	-----------------	------	------	------	------	-------	-------	-------	-------	------	-------	-----	-----	-------

*Examination of Water from Well of Congregational Society.*

7249	1909 Aug. 6	Slight	S. ferrug	None	.05	.....	.....	.0015	.0020	.0025	.0006	.40	3.9	.....
------	----------------	--------	-----------	------	-----	-------	-------	-------	-------	-------	-------	-----	-----	-------

**Canterbury.***Examination of Water from a Spring Supplying Canterbury Shakers.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
7318	1909 Aug. 30	None	V. slight	None	0.00	.....	.....	.0005	.0008	.0300	.0000	.90	3.9	.....

*Examination of Water from an Artificial Pond Supplying Canterbury Shakers.*

7320	Aug. 30	V. slight	Sl. flocc.	None	0.05	3.5	1.0	.0015	.0100	.0050	.0000	.05	.9	.03 ..
------	---------	-----------	------------	------	------	-----	-----	-------	-------	-------	-------	-----	----	--------

**Center Harbor.**—During 1900 a supply derived from springs was inaugurated by J. S. Graves. This has since been discontinued, being succeeded by a system recently installed by S. F. Emery. The source of the latter is an artificial reservoir fed by springs. Most of the houses on the main street are now supplied from this source and the system, which represents water of excellent quality, is being extended.

This town has many natural springs, a number of which are rather extensively used as supply for the houses of the village. An analysis of water from the Sibley Spring, a supply of some local repute, is here given. At the time this sample was collected the water showed a distinct foul odor, suggestive of some abnormal condition. A number of samples of well water collected by the State Board of Health during August, 1910, were found to represent polluted supplies.

*Examination of Water from Spring Supply of S. F. Emery.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
7955	1910 June 12	None	S. earthy	S. earthy	0.05	6.5	4.0	.0016	.0010	.0150	.0000	.12	3.6	.....

*Examination of Water from Sibley Spring.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
8275	1910 Aug. 3	None	V. S. floe	Dist. foul	0.00	.....	.....	.0050	.0035	.0025	.0000	.10	3.2	.....

**Charlestown.**—A new gravity system from Mill Brook was completed during 1906. There are two reservoirs on the same brook, about 60 rods apart and two miles from the village. The water is mostly from springs. About six miles of galvanized iron service pipe are in use. Cost of system, \$53,000. One hundred families are supplied—about two thirds of the population.

*Examination of Water from Brook, Proposed Public Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
2940	1905 July 1	None	S. floe.	None	0.28	4.9	2.0	.0000	.0030	.0200	.0000	.07	1.2	.....
4040	1906 Oct. 3	None	V. slight	None	0.20	7.0	4.5	.0014	.0062	.0050	.0000	.10	2.6	.....
4444	1907 Apr. 18	V. slight	V. slight	Sl. veg.	0.12	3.7	1.5	.0004	.0024	.0100	.0000	.07	.7	.....
4946	1907 Oct. 12	V. slight	V. slight	None	0.40	4.2	2.5	.0016	.0080	.0020	.0000	.19	.4	..... *
5211	1908 Apr. 2	None	V. slight	None	0.15	2.8	1.8	.0050	.0048	.0050	.0000	.12	0.4	.....
5622	1908 Sept. 7	V. faint opal.	Slight	Mark veg.	0.00	6.8	4.3	.0034	.0050	.006	.0000	.10	2.6	.....
5858	1908 Nov. 25	None	None	None	0.20	4.5	2.5	.0015	.0060	.0025	.0004	.18	1.4	..... *
7057	1909 May 24	None	Sl. veg.	V.S. vg.	0.20	4.9	2.3	.0030	.0035	.005	.0000	.10	.7	.....
7404	1909 Sept. 30	Slight	V. slight	None	0.30	4.8	2.5	.0010	.0010	.005	.0000	.10	1.4	..... *
7749	1910 Mar. 22	V. slight	Slight	Swampy	0.15	3.4	1.1	.0008	.0032	.0040	.0000	.16	.6	.....

\* B Coli present.

**Claremont.**—The town owns a water supply derived from streams situated on Green Mountain, together with an auxiliary system of wells dug along the bank of Sugar River. The latter, which are about fifteen feet deep and covered with five feet of earth, afford an abundant reserve supply, the water being pumped to the lowest of the stream reservoirs as needed. The main supply is drawn from the three brook reservoirs, the combined capacity of which is 32,000,000 gallons. Twenty and one-half miles of distributing mains are of cement and cast iron. Service pipes are of galvanized and cement-lined iron, supplying about twelve hundred families. The watershed drained by this supply is mainly wooded, with some pasturage, and with but one or two dwellings.

Besides the public supply there are two private systems of water works in Claremont; one, the Bible Hill Aqueduct, was built in 1870, the source being springs and a brook. The springs are excavated about a reservoir and the latter is also fed by springs in the bottom. Lead service pipes. About one hundred and sixty families are supplied by this system.

The other private system, known as the Grannis Water Works, built about 1892 and owned and operated by Herman Holt, Esq., is also supplied by springs. There are two small reservoirs from which this water is taken: one some 30 feet in diameter, and about three feet deep on an average; the other some 75 feet in diameter and of an average depth of about three feet. (See special report elsewhere.)

*Examination of Water from Town Supply Reservoir.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
797	1902 Sept. 11	None	None	S. veg.	0.15	6.30	2.30	.0000	.0056	.0000	.0000	.12	1.9	....
1323	1903 July 13	None	None	S. musty	0.2	4.30	2.20	.0000	.0056	.0000	.0000	1.07	1.9	....
1942	1904 May 9	Slight	None	None	0.1	5.60	4.40	.0000	.0030	.0000	.0000	.07	2.6	....
2668	1905 Jan. 30	None	None	Pec.	0.15	5.1	3.0	.0000	.0010	.0100	.0000	.12	1.5	....
3028	July 28	V. slight	S. fine	Slight	0.15	4.9	3.1	.0014	.0050	.0100	.0000	.10	1.9	....
3873	1906 Aug. 21	None	V. slight	Veg'ble	0.30	5.5	4.0	.0006	.0060	.0000	.0000	.05	1.2	....
4082	Oct. 22	None	Sl. flocc.	Earthy	0.05	4.7	3.3	.0018	.0070	.0050	.0001	.40	2.3	....
4496	1907 May 2	None	Slight	M. veg.	0.20	2.8	2.1	.0010	.0048	.0050	.0000	.19	0.9	....
4935	Oct. 8	Slight	V. slight	None	0.30	5.5	3.4	.0036	.0074	.0070	.0000	.20	2.3	....
5205	1908 Apr. 3	Slight	V. slight	S. earthy	0.25	4.8?	1.5	.0008	.0036	.0080	.0000	.21	1.2	....
5444	July 20	Marked	Consid. gel.	None	.00	4.6	2.9	.0020	.0028	.0040	.0000	.09	1.2	....
5482	Aug. 6	Sl. opal	Mod. gel	None	0.60	4.8	3.2	.0032	.0054	.0070	.0000	.13	1.8	.... *
5506	Aug. 13	V. slight	V. slight	Forei'n	0.15	5.5	2.5	.0014	.0090	.0000	.0000	.04	1.5	.... *
5507	Aug. 13	Slight	M. flocc.	None	0.30	5.5	3.0	.0008	.0004	.0050	.0000	.14	1.1	....
5571	Aug. 28	V. slight	Sl. fine	Sl. foul	0.15	5.3	2.3	.0004	.0060	.0030	.0000	.12	1.9	.... *
5639	Sept. 15	Mod.	S. fibr.	None	0.05	4.7	2.8	.0042	.0004	.0020	.0000	.14	1.9	.... *
5792	Oct. 22	None	V. slight	Woody	0.04	9.5	7.8	.0040	.0010	.050	.0014	.21	1.4	....
5868	Nov. 30	Sl. opal	Slight	None	0.10	3.4	2.1	.0001	.0015	.0000	.0000	.23	1.1	....
7079	1909 June 3	None	V. slight	None	0.10	.....	.....	.0015	.0060	.0050	.0000	.11	1.5	.... <sup>1</sup>
7242	Aug. 4	None	None	None	0.20	3.5	1.8	.0020	.0040	.005	.0000	.10	1.9	.... <sup>1</sup>
7324	Aug. 30	None	None	None	0.00	6.0	.....	.0002	.0010	.005	.0000	.20	2.0	....
7403	Sept. 30	V. faint	V. slight	None	0.05	4.1	2.6	.0010	.0015	.005	.0000	.10	1.8	.... <sup>2</sup>
7741	.....	V. slight	None	Earthy	0.05	2.9	1.4	.0060	.0050	.004	.0000	.21	.9	....
8111	1910 July 14	V. slight	V. slight	Sl. foul	0.05	3.9	2.3	.0000	.0010	.0025	.0000	.10	1.9	.... *

\* B. Coli present; <sup>1</sup> Drinking Fountain at Tremont Square; <sup>2</sup> Pump from wells on Kelsey's Islands.



*Examination of Water from Bible Hill Aqueduct.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
895	1902 Oct. 29	None	None	None	0.0	8.70	5.30	.0000	.0022	.0150	.0000	.09	3.1	V.S. ..
3378	1906 Jan. 7	None	None	None	0.00	8.8	5.8	.0008	.0016	.0200	.0000	.15	3.9	Tr. ..
3975	Sept. 13	None	None	None	0.05	11.1	8.0	.0010	.0074	.0100	.0000	.05	3.2	.015 ..
4476	1907 Apr. 29	None	None	V. slight	0.00	5.6	4.0	.0010	.0014	.0500	.0000	.14	2.6	.....
4934	Oct. 8	V. slight	V. slight	None	0.00	6.2	4.2	.0004	.0050	.0050	.0000	.15	3.2	.....
5573	1908 Aug. 28	None	Mod. earthy	None	0.05	5.3	3.8	.0002	.0002	.0020	.0000	.12	2.8	Hgh

*Examination of Water Supplied by Grannis Water Works. (Holt System.)*

236	1901 Oct. 28	None	None	None	0.0	7.10	4.40	.0028	.0044	.0200	.0003	.07	.....	.....
237	Oct. 28	None	None	None	0.0	9.20	5.30	.0028	.0054	.0200	.0003	.07	.....	.....
241	Oct. 31	None	None	None	0.0	7.80	5.70	.0010	.0040	.0200	.0004	.07	2.4	.....
3042	1905 Aug. 1	Consid. earthy	Slight.	Earthy	0.30	8.2	6.6	.0000	.0026	.0100	.0000	.07	3.9	S. tr. ..
3364	1906 Jan. 4	None	None	None	0.00	7.5	5.2	.0010	.0010	.0100	.0000	.10	5.0	0150 ..
7675	1909 Feb. 25	None	V. Sl. ferrug.	S. earthy	0.05	7.3	5.9	.0008	.0004	.0050	.0000	.09	5.3	.....
7985	1910 June 23	None	Slight	None	0.05	5.8	4.0	.0010	.0020	.0025	.0000	.06	3.9	.....

*Examination of Water from Sugar River.*

5749	1908 Oct. 12	None	V. slight	None	0.15	4.3	2.9	.0032	.0080	.0030	.0000	.25	1.2	.... *a
5818	Nov. 3	None	S. veg.	None	0.20	3.5	1.6	.0005	.0060	.0030	.0000	.22	0.9	.... *c
5819	Nov. 3	V. slight	S. veg.	S. earthy	0.10	5.4	3.1	.0010	.0035	.0030	.0000	.23	2.5	.... *b

\* B. Coli present; *a* Just above wells; *b* Near Banner Ice House; *c* Above upper dam.



*Examination of Water from Marshall Pond.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
5737	1908 Oct. 8	Slight	Slight	Slight	0.20	3.3	1.5	.0020	.0214	.0050	.0000	.05	.1	....	*

*Examination of Water from Tap, Supply of S. P. Flint.*

7322	1909 Aug. 30	V. slight	Sl. veg.	Sl. veg.	0.00	.....	.....	.0002	.0030	.0050	.0000	.05	3.2	.....	..
7742	1910 Mar. 21	None	S. earthy	S. earthy	0.00	6.3	4.3	.0004	.0034	.0080	.0000	.16	4.0	.....	..

*Examination of Water from Red Water Brook.*

7514	1909 Nov. 23	Slight	Sl. flocc.	faint	1.20	.....	.....	.0020	.0200	.0050	.0000	.15	1.8	.....	..
------	-----------------	--------	------------	-------	------	-------	-------	-------	-------	-------	-------	-----	-----	-------	----

*Examination of Water from Spring of Sullivan Machinery Company.*

5564	1908 Aug. 28	None	None	None	0.00	9.8	6.7	.0006	.0024	.0300	.0001	1.28	4.2	....	*
5580	Sept. 1	None	V. slight	None	0.00	.....	.....	.0008	.0010	.0800	.0000	1.26	4.6	.....	..

*Examination of Water from Spring Leased by Claremont Aqueduct Association.*

5789	1908 Oct. 21	V. slight	Mod. earthy	None	0.00	6.3	4.3	.0010	.0002	.0000	.0000	.08	2.8	Tr.	*
------	-----------------	-----------	-------------	------	------	-----	-----	-------	-------	-------	-------	-----	-----	-----	---

\* B. Coli present.

*Examination of Ice Cut from Sugar River.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
5936	1909 Jan. 14	None	None	Faint sewage	0.00	1.0	....	.0015	.0020	.0000	.0000	.03	.0	....
5937	Jan. 14	None	V. slight	S. earthy	0.00	1.2	....	.0008	.0005	.0000	.0000	.03	.0	....

*Examination of Water Supply of Camp Ground Association, Claremont Junction.*

5159	1908 Mar. 5	V. slight	S. earthy	Earthy	0.10	.....	.....	.0100	.0096	.0100	.0000	.63	4.6	....	<i>c</i>
5160	Mar. 5	None	None	None	0.00	.....	.....	.0004	.0024	.0120	.0000	.40	1.2	....	<i>d</i>
5161	Mar. 5	None	None	None	0.05	.....	.....	.0036	.0024	.0080	.0000	.19	8.9	....	<i>e</i>

*c* Brook; *d* Pump in ravine; *e* Spring under pumphouse.

**Colebrook.**—This town does not own a public water supply. There are two private systems, the J. E. Lombard Water Works, supplying about forty families with water from springs, and the Colebrook Water Company, which constitutes the principal supply. The source of the latter is a stream and springs, and the water flows about four miles through iron pipes, both main and service. Three fourths of the watershed is cleared, and one fourth wooded. There are many private wells within the radius reached by these supplies.

*Examination of Water from Colebrook Water Company's Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
	1904													
2378	Sept. 15	Marked	Slight	None	0.4	10.40	3.90	.0000	.0044	.0050	.0000	.050	5.5	.....
2379	Sept. 15	None	V. much floc. veg.	None	1.1	11.00	2.80	.0000	.0001	.0000	.0001	.05	4.4	.....
2380	Sept. 15	None	None	None	0.0	10.00	5.20	.0000	.0000	.0300	.0000	.07	2.7	.....
2381	Sept. 15	None	V. much floc. veg.	None	0.5	11.70	5.00	.0000	.0072	.0000	.0000	.05	4.8	.....
	1905													
2636	Jan. 9	None	V. much	Veg.	0.05	8.7	5.9	.0000	.0020	.0150	.0006	.07	2.7	..... *
3089	Aug. 15	None	None	None	0.28	10.3	6.8	.0006	.0038	.0150	.0000	.05	5.5	.....
	1906													
3363	Jan. 3	None	None	S. veg.	0.15	9.3	6.7	.0006	.0014	.0300	.0000	.05	4.9	.....
3866	Aug. 18	None	None	None	0.40	9.3	7.3	.0014	.0080	.0000	.0000	.12	4.5	..... *
	1907													
4430	Apr. 10	None	None	Slight	0.33	6.7	4.2	.0016	.0044	.0200	.0000	.07	3.2	.....
4945	Oct. 11	None	V. slight	None	0.70	6.0	3.3	.0014	.0084	.0040	.0000	.19	3.2	.....
	1908													
5210	Apr. 3	None	None	None	0.10	7.0	5.6	.0014	.0030	.0080	.0000	.05	3.2	.....
5635	Sept. 14	V. slight	V. slight	Earthy	0.10	.....	.....	.0012	.0042	.0020	Tr.	.06	6.0	.....
5636	Sept. 14	None	V. slight	Earthy	0.00	11.3	9.5	.0002	.0002	.0100	.0000	.08	7.6	.....
	1909													
7427	Oct. 7	None	V. slight	None	0.05	9.2	5.2	.0010	.0100	.0050	.0000	.10	4.4	.....
	1910													
7781	Apr. 10	None	S. coarse	None	0.70	1.7	.6	.0032	.0085	.0150	.0000	.07	2.2	.....

\* B. Coli present.

*Examination of Water from the J. E. Lombard Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
3057	1905 Aug. 6	None	S. ferrug.	S. earthy	0.05	10.80	5.6	.0006	.0010	.0300	.0000	.05	3.9	.....
3367	1906 Jan. 4	None	None	None	0.05	5.3	3.0	.0006	.0018	.0230	.0000	.05	2.6	.....
3869	Aug. 20	None	Slight	None	0.05	5.0	3.3	.0008	.0010	.0050	.0000	.05	.....	.....
7425	1909 Oct. 7	None	None	None	0.00	6.0	3.0	.0010	.0010	.010	.0000	.05	3.2	.....*

\* B. Coli present.

**Concord.**—The Concord Water Works, owned and operated by the city, were installed in 1871–72; extended to Penacook and St. Paul's School in 1882; high service extension in 1891; high service extended to Penacook in 1904. The source of the supply is Penacook Lake, with an area at high water of 337 acres; greatest area of good depth running from 10 to 75 feet; very little shallow water; bottom gravelly. The watershed, about 3 1-8 square miles, is partly wooded and partly cleared. The shores, excepting Penacook Park, which is well policed, are now rarely frequented by picnic parties. A few cottages, occupied during the summer, have been built on the shores, but they are under sanitary supervision of the city health officer. The State Board of Health has also established rules and regulations for the protection of the purity of this body of water. The city owns and controls four fifths of the shore.

The Plains Water Company, established in 1895, furnishes water to Concord Plains from a well six feet in diameter and dug in the sand to a depth of fifty feet. This well has been extended to a further depth of twelve feet by sinking an iron pipe at the bottom. The water is pumped to a wooden storage tank of 8,000 gallons' capacity.

*Examination of Water from City Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
1901														
1	May 22	V. slight	Slight	Dec.vg.	0.0	2.90	1.80	.0015	.0163	.0048	.0000	.13	.....	..
2	May 22	V. slight	Slight	Faint veg.	0.0	.....	.....	.0013	.0122	.0048	.0000	.12	.....	..
3	May 22	Slight	Consid.	Dec.vg.	0.0	.....	.....	.0013	.0149	.0048	.0000	.12	.....	..
4	May 23	Slight	Consid.	Dec.vg.	0.0	2.50	1.20	.0014	.0137	.0050	.0000	.12	.....	..
107	Aug. 6	None	None	Dec.vg.	0.12	3.30	1.90	.0000	.0154	.0000	.0000	.11	.....	..
113	Aug. 12	Slight	Sl. floe.	Dec.vg.	0.1	4.00	1.40	.0014	.0156	.0000	.0000	.10	.....	..
1902														
357	Jan. 11	None	None	Veg.	0.1	3.20	1.20	.0030	.0138	.0000	.0000	.14	1.1	.....
398	Feb. 10	V. slight	V. slight	Veg.	0.12	3.70	1.90	.0044	.0136	.0000	.0000	.12	.9	.....
591	June 13	V. slight	V. slight	Dec.vg.	0.15	5.30	1.50	.0016	.0146	.0000	.0000	.11	.7	.....
592	June 13	V. slight	Slight	Dec.vg.	0.1	6.20	1.60	.0000	.0124	.0000	.0000	.11	.7	.....
593	June 13	V. slight	V. slight	Slight	0.15	5.50	2.10	.0006	.0072	.0000	.0000	.11	.7	.....
594	June 13	V. slight	V. slight	Veg.	0.15	6.10	1.70	.0006	.0126	.0000	.0000	.11	.7	.....
595	June 13	V. slight	V. slight	Veg.	0.15	6.70	1.70	.0006	.0108	.0000	.0000	.12	.7	.....
596	June 13	None	None	Veg.	0.15	6.20	1.60	.0000	.0112	.0000	.0000	.11	.7	.....
775	Sept. 4	None	None	Dec.vg.	0.1	4.30	1.50	.0000	.0102	.0000	.0000	.12	1.5	.....
13	Nov. 11	None	None	Sl. veg.	0.05	5.80	1.60	.0000	.0094	.0000	.0000	.14	1.5	.....
1903														
966	Jan. 1	None	None	Sl. veg.	0.12	5.40	1.60	.0000	.0086	.0000	.0000	.17	1.5	.....
983	Jan. 12	None	None	Sl. veg.	0.05	.....	.....	.....	.....	.0000	.0000	.....	.....	..
1078	Mar. 7	None	None	V. slight	0.05	.....	.....	.0006	.0056	.0050	.0000	.15	1.8	.....
1153	Apr. 21	Slight	Fine	Dec.vg.	0.05	2.90	1.40	.0000	.0030	.0000	.0000	.15	1.4	.....
1269	June 19	None	None	Sl. veg.	0.05	.....	.....	.....	.....	.....	.....	.....	.....	.027
1904														
1924	May 6	Slight	Slight	Sl. veg.	0.05	3.10	1.60	.0006	.0054	.0000	.0000	.15	1.5	.....
2371	Sept. 15	None	None	Sl. veg.	0.05	3.80	0.90	.0000	.0044	.0000	.0000	.13	1.5	..... *
2584	Dec. 13	V. slight	Slight	Slight	0.05	2.3	1.3	.0000	.0114	.0000	.0000	.15	0.4	..... *
1905														
3025	July 27	None	V. slight	S. earthy	0.20	3.7	1.5	.0020	.0134	.0050	.0000	.12	0.9	.....
1906														
3413	Jan. 25	None	None	Sl. veg.	0.05	4.3	2.3	.0014	.0074	.0050	.0000	.15	0.6	.....
3918	Aug. 31	None	V. slight	S. musty	0.05	3.0	1.5	.0006	.0084	.1000	.0000	.12	0.4	.....
3999	Sept. 19	S. opal	V. slight	Slight	0.10	3.2	1.2	.0020	.0100	.0050	.0000	.15	0.4	.....

\* B Coli present.



*Examination of Water from City Supply.—Concluded.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
4413	1907 Apr. 8	None	V. slight	Sl. veg.	0.10	2.8	0.7	.0012	.0062	.0000	.0000	.14	0.9	....
4718	July 16	None	V. slight	Earthy	0.05	3.6	1.1	.0014	.0090	.0050	.0000	.16	0.4	.... *
4762	July 25	None	None	Earthy	0.05	.....	.....	.0010	.0048	.0050	.0000	.20	1.2	....
5221	1908 Apr. 10	V. slight	Slight	Swampy	0.10	3.0	1.5	.0002	.0058	.0030	.0000	.15	0.4	....
5346	June 12	V. slight	Sl. floc.	Veg.	0.10	.....	.....	.0006	.0044	.0030	.0000	.10	1.2	....
5866	Nov. 27	None	V. slight	S. Marshy	0.05	2.4	1.0	.0010	.0080	.0000	.0000	.10	.30	....
7251	1909 Aug. 9	V.S. opal	V. slight	S. earthy	0.30	4.0	3.0	.0010	.0040	.005	Tr.	.12	1.20	.... *1
7270	Aug. 12	None	None	None	0.05	3.4	1.8	.0008	.0040	.005	.0000	.12	.40	....
7423	Oct. 7	None	None	None	0.00	2.7	1.2	.0002	.0060	.005	.0000	.14	.30	....
7501	Nov. 3	None	V. slight	None	0.05	.....	.....	.0002	.0050	.0000	.0000	.15	.9	.... 2
7502	Nov. 3	None	None	Slight	0.05	2.2	.7	.0001	.0070	.0000	.0000	.16	.9	.... 3
7740	1910 Mar. 22	Slight	V. slight	None	0.05	3.5	1.9	.0026	.0050	.0020	.0000	.10	.60	....
8176	July 24	V. slight	Med. floc	Stale	0.10	.....	.....	High	.0098	.005	.0000	.10	1.0	.... 4

\* B. Coli present; <sup>1</sup> Tap, Contoocook River Park; deadend of line; <sup>2</sup> Tap, St. Paul's School; Tap in lower school kitchen, St. Paul's School; <sup>4</sup> Taken from foul pipe.

*Examination of Water from Concord Plains Supply.*

5711	1908 Sept. 30	Slight	V. slight	S. earthy	0.20	.....	.....	High	.0066	.1000	.0008	.70	....	....
5764	Oct. 16	None	V. S. earthy	S. earthy	0.00	2.5	.....	.0025	.0028	.0080	.0000	.25	.4	....
5765	Oct. 16	S. opal.	S. earthy	M. earthy	0.20	5.0	.....	.0172	.0025	.0100	.0002	.52	1.4	....
5793	Oct. 23	V. slight	V. slight	None	0.20	4.1	1.9	.0075	.0001	.2250	.0010	.38	1.9	....

*Examination of Water from Well in Penacook Park.*

3906	1906 Aug. 27	None	V. slight	Sl. veg.	0.10	8.2	4.6	.0010	.0016	.0050	.0000	.35	....	.... *
4619	1907 June 15	None	None	Woody	0.05	.....	.....	.0008	.0002	.0050	.0000	.31	2.5	....
4666	June 26	None	None	Slight	0.00	.....	.....	.0002	.0002	.0050	.0000	.25	2.4	....

\* B. Coli present.



*Examination of Water from Well in White's Park.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
3917	1906 Aug. 31	None	None	None	0.35	11.5	7.0	.0010	.0020	.2000	.0000	.97	.....	..
7153	1909 July 1	None	None	None	0.00	.....	.....	.0020	.0015	.400	.0000	1.00	2.9	.....
7230	Aug. 3	None	None	S. Distinct foul	0.00	11.5	.....	.0010	.0010	.450	.0000	1.00	3.2	.....
8175	1910 July 21	None	V. slight	None	0.05	12.2	5.6	.0014	.0028	.200	.0000	.95	3.9	.....

*Examination of Ice from Eddy Pond, Owned by Concord Ice Company.*

7760	1910 Mar. 29	None	Slight	S. foul	0.05	4.5	2.2	.0020	.0048	.006	.0000	.06	.3	.....	<i>a</i>
7761	Mar. 29	None	V. slight	Slight	0.00	2.8	1.1	.0024	.0026	.002	.0000	.06	.3	.....	<i>b</i>

*a* Snow in surface layer; *b* Clear in lower layer.

*Examination of Water from Spring on Property of the State Prison.*

6084	1909 Apr. 5	None	None	None	0.00	4.4	2.4	.0002	.0001	.0050	.0000	.10	.10	.....	..
------	----------------	------	------	------	------	-----	-----	-------	-------	-------	-------	-----	-----	-------	----

*Examination of Water from Spring, Proposed Supply of East Concord Schools.*

7101	1909 June 10	None	V. slight	None	0.00	5.5	.....	.0014	.0050	.0300	.0000	.24	3.9	.....	..
------	-----------------	------	-----------	------	------	-----	-------	-------	-------	-------	-------	-----	-----	-------	----

**Conway.**—The Conway Aqueduct Company supplies Conway Village with water from a system of natural springs about two and one-half miles from the Center.

The village of North Conway and, except during the winter, the villages of Intervale and Kearsarge are furnished with water by the North Conway Water & Improvement Company, the source being three brooks located on Hurricane Mountain and the water of which is

stored in three separate reservoirs, known as the Hurricane, the Middle and the Artist Falls reservoirs. Commencing at the Fairview in Intervale, all the houses to the southern limits of North Conway are supplied by this system.

*Examination of Water from Faucet of Conway Aqueduct Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
2396	1904 Oct. 2	None	Slight	Sl. veg.	0.25	2.6	2.2	.0000	.0000	.0000	.0001	.07	0.9	....
2402	Oct. 2	None	Slight	None	0.20	6.8	3.4	.0000	.0000	.0000	.0000	.05	1.8	....
3050	1905 Aug. 4	None	None	S. earthy	0.10	2.6	1.1	.0000	.0024	.0050	.0000	.07	0.6	....
3405	Jan. 21	None	None	None	0.10	4.4	1.2	.0010	.0014	.0100	.0000	.12	0.3	....
4579	1907 May 29	None	None	None	0.10	2.3	1.3	.0006	.0018	.0750	.0000	.11	0.4	....
4938	Oct. 9	None	None	None	0.80	3.2	2.0	.0008	.0068	.0030	.0000	.14	1.2	No ..
5226	1908 Apr. 13	V. slight	V. slight	None	0.20	2.3	1.5	.0000	.0010	.0030	.0000	.05	0.4	No ..
5808	Oct. 28	None	None	S. earthy	0.15	1.7	.6	.0030	.0010	.0000	.0000	.05	.3	.025 ..
5849	Nov. 17	None	None	None	0.10	2.5	1.7	.0020	.0001	.0100	.0000	.04	.1	0 ..
5850	Nov. 17	None	None	None	0.10	2.4	1.4	.0010	.0005	.010	.0000	.04	.1	0 ..
6014	1909 Feb. 23	None	None	None	0.05	2.5	1.8	.0001	.0010	.020	.0000	.05	.1	....
7310	Aug. 20	None	Slight	Faint fishy	0.05	.....	.....	.0010	.0008	.005	.000	.10	.3	.... *
7334	Sept. 1	V. slight	V. slight	None	0.05	3.0	.....	.0002	.0008	.005	.0000	.05	.3	.... *
7372	Sept. 20	None	None	None	0.05	3.8	2.0	.0010	.0012	.005	.0000	.08	.9	.... *
7535	Dec. 1	None	None	None	0.00	2.3	1.6	.0010	.0020	.005	.0000	.08	.4	....
7753	1910 Mar. 24	Slight	Slight	Earthy	0.20	4.2	2.3	.0004	.0036	.004	.0000	.08	.6	....
8133	July 15	None	V. slight	Musk	0.05	2.5	2.2	.0024	.0006	.005	.0000	.05	.9	....
8134	July 15	None	V. slight	None	0.05	2.4	1.7	.0002	.0004	.005	.0000	.05	.9	....
8265	Aug. 2	None	V. slight	None	0.00	.....	.....	.0010	.0013	.020	.0000	.04	.9	0 ..
8276	Aug. 4	Mod.	Med. floe	Musk	0.70	5.0	3.0	.0010	High	.005	.0000	.05	1.6	.... *
8342	Aug. 22	None	S. floe.	S. earthy	0.00	2.5	1.0	.0010	.0015	.005	.0000	.08	0.4	....

\* B. Coli present. Six special examinations for colon bacilli made during the period September 1, 1908, to August 31, 1910, resulted in six positive and three negative findings.

*Examination of Water Supplying North Conway.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
3159	1905 Sept. 12	None	None	Slight	0.10	2.7	0.8	.0008	.0042	.0100	.0000	.07	0.3	....	..
3206	Sept. 29	None	None	Veg.	0.15	4.5	2.5	.0020	.0030	.0100	.0000	.05	0.6	....	<i>b</i>
3207	Sept. 29	None	None	Earthy	0.10	3.3	2.0	.0020	.0024	.0100	.0000	.05	0.1	....	<i>*c</i>
3508	1906 Mar. 5	None	None	Veg.	0.05	2.4	1.0	.0008	.0034	.0100	.0000	.05	0.4	....	..
3714	June 28	None	None	None	0.10	2.5	1.0	.0026	.0020	.0050	.0000	.05	0.3	....	<i>*c</i>
3715	June 28	None	V. slight	None	0.10	3.0	1.0	.0014	.0020	.0030	.0000	.05	0.3	....	<i>*d</i>
3716	June 28	Slight	Consid. flocc.	Veg.	0.40	8.3	1.7	.0192	.0800	.0000	.0000	.10	....	....	<i>*e</i>
7927	1910 May 25	None	V. slight	None	0.05	2.7	1.6	.0030	.0035	.0025	.0000	.07	.7	....	..
7965	June 14	None	V. slight	None	0.10	2.4	1.9	.0015	.0020	.0025	.0000	.04	.7	....	..
7966	June 14	V. slight	V. slight	None	0.05	3.4	2.2	.0025	.0020	.0025	.0000	.05	.6	....	<i>*</i>
8055	July 7	None	V. slight	None	0.05	.....	.....	.0005	.0020	.0050	.0000	.04	.4	....	<i>*</i>

\* B. Coli present; *b* Reservoir No. 1; *c* reservoir No. 2; *d* reservoir No. 3; *e* Shingle Pond.

**Cornish.***Examination of Ice from Blow-me-down Brook.*

7581	1909 Dec. 23	None	V. slight	Earthy	0.00	.....	.....	.0002	.0010	.0000	.0000	.05	1.5	....	..
7583	Dec. 26	V. faint	S. fibrous	S. earthy	0.00	.....	.....	.0045	.0030	.0000	.0000	.05	.3	....	..

**Croydon.**—One private supply is from a spring, the water being brought one-half mile through lead pipe, from which eight families are furnished.

**Dalton.***Examination of Water from Forest Lake.*

4657	1907 June 21	None	None	Slight	0.20	.....	.....	.0046	.0130	.0050	.0000	.17	0.6	....	..
------	-----------------	------	------	--------	------	-------	-------	-------	-------	-------	-------	-----	-----	------	----

**Derry.**—During 1910 the town of Derry purchased the Derry Water Works. This supply, built in 1890, consists of about 40 wells

driven to a depth of fifty feet. The water is pumped to a stand pipe of 180,000 gallons' capacity.

The former practice of pumping from a polluted auxiliary (a brook) during times of low water or fire has been discontinued, it having been agreed that future resort to the brook supply shall be made only in case of a great emergency.

*Examination of Water from Faucet of Derry Water Works Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
794	1902 Sept. 4	None	Slight	V. slight	0.0	6.40	4.80	.0000	.0012	.0120	.0000	.60	3.1	.....
1372	1903 July 24	None	None	S. musty	0.0	7.00	3.60	.0000	.0010	.1500	.0000	.65	2.3	.....
1532	1903 Sept. 2	None	V. slight	None	0.1	12.40	6.80	.0000	.0038	.0700	.0000	.55	2.4	.....
1946	1904 Mar. 10	None	None	S. veg.	0.05	6.90	4.90	.0000	.0014	.1500	.0000	.65	2.6	.....
2676	1905 Feb. 1	None	None	None	0.00	8.7	6.5	.0000	.0000	.1000	.0000	.72	2.6	.....
3068	1905 Aug. 9	None	None	Slight	0.00	8.0	4.7	.0000	.0008	.0850	.0000	.62	2.7	.....
3362	1906 Jan. 4	None	None	None	0.05	7.5	4.8	.0006	.0024	.1000	.0000	.25	2.9	.....
3855	1906 Aug. 17	None	V. slight	S. earthy	0.20	7.0	4.0	.0006	.0064	.0050	.0000	.55	2.2	.....
4205	1906 Dec. 5	None	None	None	0.05	7.4	4.3	.0006	.0030	.1000	.0000	.75	2.6	.....
4206	1906 Dec. 5	V. slight	V. slight	S. veg.	0.30	6.2	3.2	.0046	.0214	.0050	.0000	.30	2.2	..... *
4207	1906 Dec. 5	None	None	Earthy	0.03	7.4	4.2	.0010	.0030	.1400	.0000	.67	2.3	..... *
4429	1907 Apr. 11	None	V. slight	None	0.10	8.8	5.9	.0016	.0010	.2500	.0000	.85	2.6	.....
4831	1907 Aug. 26	.....	.....	.....	0.20	.....	.....	.0014	.0064	.0050	.0000	.51	1.9	.....
4933	1907 Oct. 7	V. slight	V. slight	None	0.30	6.5	3.8	.0002	.0074	.0150	.0000	.38	2.6	..... *
5171	1908 Mar. 16	None	None	None	0.15	7.3	4.6	.0010	.0012	.0200	.0000	.40	3.2	.....
5196	1908 Mar. 30	None	None	None	0.00	.....	.....	.0004	.0010	.0350	.0000	.86	2.6	.....
5219	1908 Apr. 8	None	None	None	0.00	4.7	3.1	High	.0028	.0150	.0000	.72	3.2	.....
5925	1909 Jan. 6	None	None	None	0.05	8.3	4.5	.0001	.0008	.350	.0000	.92	2.6	.....
7271	1909 Aug. 11	None	None	None	0.00	9.0	5.0	.0005	.0010	.150	.0000	.70	2.4	.....
7754	1910 Apr. 5	None	None	None	0.05	8.7	5.7	.0016	.0042	.075	.0000	.92	3.7	.....
7908	1910 May 20	None	S. earthy	S. earthy	0.10	9.6	6.6	.0010	.0020	.150	.0010	.95	3.9	..... †

\* B. Coli present. † .4 Zinc.

**Dover.**—The public water supply originally installed by the city (in 1888) was taken from Willand's Pond, the original area of which (78 3-4 acres) has of late been greatly reduced. In 1905 a system of springs, known as the Hussey Springs, was added to the supply. The latter has proved quite unsatisfactory, one objection being the excessive quantity of iron appearing in this supply as a result of the solvent action of the carbonic acid derived from the peaty surface soil, upon the underlying ferruginous sand. A second serious objection has arisen in the rather frequently occurring acid condition of the springs water apparently due to some form of non-volatile soil acid derived from the peat.

During 1909 a modern and extensive slow and filtration plant was installed, its object being partly the removal of the iron from the spring water, partly to insure the safety of the pond supply. While these filters are doing excellent work it has been found necessary to discontinue use of certain of the iron springs and an attempt is at present being made to supplant these and the shortage from the diminishing pond supply by securing other sources.



*Examination of Water from Willand's Pond.*

Numb.r.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Iron.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
246	1901 Nov. 4	None	None	Faint	0.0	5.50	2.40	.0010	.0080	.0000	.0000	.19	...	...
985	1903 July 13	None	None	S. fishy	0.1	7.00	2.40	.0000	.0036	.0000	.0000	.30	1.8	...
1356	July 20	Slight	Floc. vg.	V. dec. veg.	0.1	6.20	2.50	.0010	.0146	.0000	.0000	.25	1.1	...
1422	Aug. 10	Marked	M. floc.	Veg.	0.1	7.30	2.00	.0000	.0084	.0000	.0000	.37	1.6	...
2031	1904 June 9	Marked	M. floc. veg.	S. earthy	0.1	4.50	2.90	.0008	.0034	.0000	.0000	.30	2.4	...
2035	June 9	Marked	V. much red	None	0.05	5.50	4.10	.0006	.0042	.0000	.0000	.30	2.8	...
2037	June 9	Slight	Slight	Slight	0.05	5.20	2.80	.0006	.0036	.0000	.0000	.30	2.6	...
2150	July 12	Slight	M. floc.	Dec. musty	0.05	4.10	2.30	.0000	.0092	.0000	.0000	.28	1.6	*
2151	July 12	Marked	Consid.	V. mar- ked ar- omatic	0.8	4.30	2.70	.0010	.0074	.0000	.0000	.25	2.6	*
2671	1905 Jan. 30	None	V. slight	Veg.	0.15	5.6	3.6	.0000	.0034	.0100	.0000	.35	0.9	...
3443	1906 July 11	None	Slight	M. veg.	0.20	5.0	2.5	.0014	.0084	.0150	.0000	.25	0.6	...
3744	July 11	V. slight	Slight	Veg.	0.20	4.1	2.5	.0018	.0090	.0100	.0000	.25	0.6	*
5267	1908 Mar. 29	V. slight	Slight	S. earthy	0.05	3.7	2.2	.0004	.0080	.0080	.0000	.29	0.9	.008
5327	May 28	None	V. slight	None	0.05	3.6	1.6	.0010	.0054	.0040	.0000	.30	0.4	.01

\* B. Coli present.



*Examination of Water from Taps in the City.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Iron.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
3558	1906 Apr. 13	None	Ferrug.	None	0.20	10.6	8.2	.0014	.0144	.0200	.0000	.70	3.7	....
3654	June 5	Opal	Slight	None	0.10	12.6	9.0	.0014	.0140	.0050	Tr.	.60	3.6	....
3655	June 5	Opal	M. fer.	Sl. veg.	0.13	11.0	8.5	.0012	.0040	.0050	Tr.	.60	3.2	....
3701	June 21	Mod'ate	Con. fer.	V. slight	.03	12.8	9.3	.0094	.0024	.0050	.0002	.75	5.7	.66 ..
4298	1907 Jan. 28	Mod. opal	Mod. fer.	Sl. veg.	0.30	.....	.....	.0030	.0036	.0050	.0000	.42	2.3	.40 *
4311	Jan. 29	Mod. opal	V. slight	Sl. veg.	0.15	.....	.....	.0044	.0016	.0080	.0000	.37	2.4	.15 ..
4312	Jan. 29	None	None	None	0.00	.....	.....	.0038	.0014	.0050	.0000	.40	1.9	.04 ..
4318	Jan. 29	Sl. opal	V. slight	Sl. veg.	0.10	.....	.....	.0044	.0016	.0080	.0000	.45	2.9	.10 ..
4323	Feb. 1	V. slight	V. slight	Veg.	0.10	.....	.....	.0040	.0040	.0030	Ft. tr.	.37	1.6	.035 ..
4324	Feb. 1	Slight	V. slight	Sl. veg.	0.10	.....	.....	.0064	.0048	.0030	Ft. tr.	.38	1.9	.15 ..
4325	Feb. 1	Slight	V. slight	Sl. veg.	0.10	.....	.....	.0060	.0042	.0030	Ft. tr.	.39	1.9	.13 ..
4326	Feb. 1	Slight	V. slight	Sl. veg.	0.10	.....	.....	.0079	.0054	.0070	Tr.	.39	1.6	.15 ..
4330	Feb. 6	Slight	Sl. floc.	Slight	0.05	.....	.....	.0050	.0016	.0200	.0000	.45	2.2	.17 ..
4331	Feb. 6	Mod'ate	Sl. fer.	Slight	0.15	.....	.....	.0050	.0026	.0080	.0000	.40	2.2	.09 ..
4364	Mar. 7	V. sl. opal	V. slight	V. slight	0.20	5.2	.....	.0060	.0070	.0080	Tr.	.45	1.9	.12 ..
7013	1909 Apr. 28	None	None	None	0.05	8.9	7.6	.0060	.0020	.005	.0000	.50	3.2	.01 ..
7419	Oct. 7	S. opal	None	None	0.00	11.3	6.6	.0008	.0020	.005	.0000	.45	3.2	.02 ..
7573	Dec. 22	S. opal	Slight	None	0.00	12.5	9.0	.0025	.0040	.005	.0000	.55	4.7	.... †
7574	Dec. 22	None	V. slight	None	0.00	8.5	6.0	.0020	.0070	.005	.0000	.55	3.9	.... ..
7612	1910 Jan. 21	None	Slight	None	0.00	6.0	4.0	.0045	.0025	.005	.0000	.60	1.9	Tr. ..
7722	Mar. 15	None	None	None	0.00	16.2	9.9	.0312	.0054	.005	.0000	.79	9.3	.088 ..
7723	Mar. 15	None	None	None	0.05	9.7	7.2	.0004	High	.004	.0000	.74	4.4	.035 ..
7724	Mar. 15	Slight	Mod.	None	0.05	11.1	8.3	.0012	.0120	.005	.0000	.66	5.7	.... a
8045	July 7	None	S. white	None	0.10	7.2	4.8	.0010	.0015	.005	.0000	.60	3.5	.05 ..

\* B. Coli present. † .8 Zinc. a Distinct trace of Copper.

*Examination of Water from Hussey Springs.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Iron.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
3699	1906 June 21	Sl. opal	Sl. ferrug	None	0.03	11.0	8.0	.0052	.0026	.0100	.0000	.90	3.6	1.44 ..
3941	Sept. 6	None	Mod. earthy	None	0.05	5.7	3.0	.....	.....	.0200	.0000	.50	1.4	.....
4136	Nov. 7	M. ferrug	M. ferrug	None	0.10	10.5	8.0	.0050	.0040	.0080	.0000	.77	3.7	.....
4275	1907 Jan. 9	Sl. opal	V. slight	Sl. veg.	0.05	.....	.....	.0082	.0012	.0050	.0000	.46	1.5	.048 ..
4360	Mar. 6	V. Sl. opal	V. slight	None	0.20	.....	.....	.0010	.0084	.0050	.0000	.65	4.6	.70 ..
4384	Mar. 27	Consid. opal	Mod. fine	Sl. earthy	0.12	5.2	3.9	.0030	.0040	.0200	.0000	.43	1.2	.20 ..
4386	Mar. 27	Sl. opal	Sl. fine	Sl. foreign	0.05	4.8	3.7	.0030	.0126	.0150	Tr.	.55	1.6	.06 *
4690	July 9	Sl. opal	Sl. ferrug.	Sl. earthy	0.10	4.8	3.0	.0010	.0028	.0050	Very high	.40	1.9	1.25 *
4734	July 19	None	Sl. mod.	None	0.05	5.8	4.3	.0018	.0002	.0100	.0000	.66	2.2	.06 ..
4790	Aug. 6	V. Sl. opal	V. slight	None	0.05	7.8	5.5	.0028	.0010	.0050	.0000	.80	1.2	.055 ..
4791	Aug. 6	V. Sl. opal	Sl. ferrug	None	0.10	5.2	4.4	.0024	.0014	.0050	.0000	.48	1.2	.125 *
4886	Sept. 17	None	V. slight	None	0.05	5.5	4.5	.0010	.0014	.0050	.0000	.48	1.9	.016 ..
4887	Sept. 17	None	V. slight	None	0.10	5.2	4.3	.....	.....	.....	.....	.....	.....	.....
5266	1908 Apr. 29	None	V. slight	V. slight	0.08	6.9	4.8	.0030	.0024	.0150	.0000	.52	2.4	.04 ..
5325	May 28	None	V. slight	None	0.10	8.8	5.2	.0018	.0002	.0020	.0000	.42	.26	.20 ..
7012	1909 Apr. 27	Sl. ferrug	Consid. ferrug.	None	0.20	11.0	8.8	.0120	.0020	.0050	.0000	.59	4.3	.50 ..

\* B. Coli present.

*Examination of Water from Various Sources, on Public Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Iron.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
1420	1903 Aug. 10	Marked	V. much floc.	Veg.	0.04	6.20	3.00	.0054	.0056	.0300	.0000	.38	2.8	...	<i>a</i>
1994	1904 May 27	Slight	V. much red floc.	V. slight	0.03	4.60	3.20	.0022	.0040	.0100	.0000	.43	1.6	...	<i>*a</i>
3170	1905 Sept. 15	Consid.	Con. fer.	Earthy	0.25	7.4	6.4	.0114	.0154	.0150	.0000	.42	3.1	...	<i>b</i>
3172	Sept. 14	Mod. op.	Mod'rate	Earthy	0.45	7.2	4.7	.0028	.0084	.0200	.0000	.57	1.5	...	<i>*c</i>
3281	Nov. 1	Opal	Consid. earthy	None	0.10	5.4	4.4	.0014	.0024	.0050	.0000	.57	1.4	...	<i>d</i>
3282	Nov. 1	None	S. floc.	None	0.05	5.8	4.6	.0060	.0044	.0050	.0000	.57	1.5	...	<i>e</i>
3283	Nov. 1	Slight	Con. fer.	Veg.	0.15	8.0	6.3	.0144	.0034	.0050	.0000	.50	1.6	...	<i>f</i>
3599	May 8	S. opal	Heav. fer.	S. veg.	0.30	10.9	8.4	.0090	.0024	.0500	.0000	2.48	...	...	<i>g</i>
3600	May 8	None	V. S. floc.	M. foul	0.00	6.5	5.0	.0014	.0010	.0100	.0000	.55	...	...	<i>h</i>
3602	May 8	V. S. op.	Con. floc.	Foul	0.10	9.5	6.7	.0036	.0020	.0300	Tr.	1.52	...	...	<i>g</i>
3695	1906 June 21	Mod. op.	Con. fer.	S. veg.	0.10	15.5	10.7	.0102	.0044	.0250	.0009	2.50	4.7	1.25	<i>i</i>
3696	June 21	None	None	None	0.03	7.0	5.0	.0018	.0014	.0100	.0000	.65	2.7	0.07	<i>j</i>
3697	June 21	None	V. slight	None	0.03	6.2	4.6	.0010	.0014	.0100	.0000	.65	1.6	0.10	<i>k</i>
3698	June 21	S. opal	Mod. fer.	S. veg.	0.03	17.2	12.7	.0074	.0026	.0100	.0000	1.60	6.3	2.15	<i>l</i>
4242	Dec. 21	None	V. slight	None	0.05	.....	.....	.0014	.0042	.....	.0000	.42	1.5	.035	<i>n</i>
4243	Dec. 21	None	None	None	0.00	.....	.....	.0016	.0020	.....	.0000	.42	1.9	.001	<i>m</i>
4245	Dec. 21	None	V. slight	None	0.00	.....	.....	.0010	.0020	.....	.0000	.65	1.2	.005	<i>o</i>
4276	1907 Jan. 9	None	V. slight	None	0.00	.....	.....	.0008	.0000	.0086	.0000	.38	0.7	.006	<i>g</i>
4277	Jan. 9	None	S. coarse	S. veg.	0.00	.....	.....	.0005	.0006	.0300	Tr.	.40	0.9	.010	<i>g</i>
4278	Jan. 9	S. opal	V. slight	None	0.05	.....	.....	.0008	.0020	.0300	.0000	2.70	6.0	.160	<i>p</i>
4279	Jan. 9	.....	.....	.....	0.15	.....	.....	.....	.....	.0400	Tr.	.80	2.8	.080	<i>q</i>
4691	July 9	Mod. op.	Heav. fer.	None	0.50	9.3	7.0	.0008	.0014	.0100	.0000	.88	3.2	.900	<i>j</i>
4732	July 19	None	None	None	0.00	8.5	3.5	.0010	.0002	.0400	.0000	1.24	1.9	.002	<i>m</i>
5973	1909 Feb. 5	None	V. slight	None	0.00	4.8	2.7	.0095	.0010	.0000	Tr.	.65	.70	0	<i>r</i>
5974	Feb. 5	None	Slight	None	0.00	4.5	2.3	.0100	.0090	.0000	.0000	.62	.90	0	<i>s</i>

*a* Brook in Hussey field; *b* Easterly Brook; *c* Westerly Brook; *d* west branch new collecting gallery; *e* spring near catch basin; *f* east branch new collecting gallery; *g* catch basins Nos. 1 and 2; *h* Cate Spring; *i* catch basin No. 4 on long line; *j* catch basin No. 5 on long line; *k* catch basin No. 6 on long line; *l* catch basin No. 3; *m* catch basin No. 10; *n* catch basin No. 11; *o* Red Spring; *p* catch basin No. 12; *q* catch basin No. 13; *r* outlet from filter bed No. 1; *s* Aërating chamber (raw).

*Examination of Water from Various Sources on Public Supply.—Concluded.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Iron.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
6025	1909 Mar. 10	None	Mod. ferrug.	None	0.20	15.3	6.8	.0075	.0040	.0200	.0000	.52	.20	.6	<i>t</i>
6026	Mar. 10	None	None	None	0.05	6.5	4.5	.0075	.0008	.030	.0000	.43	1.8	0	<i>u</i>
7014	Apr. 28	None	V. S. silt	None	0.00	5.9	4.6	.0060	.0015	.005	.0000	.45	2.4	...	<i>v</i>
7206	July 21	None	None	None	0.00	5.7	3.2	.0030	.0015	.005	.0000	.47	1.2	.00	<i>v</i>
7420	Oct. 7	None	Mod. ferrug.	None	0.30	7.5	5.5	.0045	.0100	.005	.0000	.45	1.9	.25	<i>w</i>
7421	Oct. 7	None	Mod. ferrug.	None	0.30	11.9	8.6	.0130	.0060	.005	.0000	.40	3.9	.35	<i>x</i>
7422	Oct. 7	None	None	None	0.00	6.7	4.0	.0001	.0030	.005	.0000	.50	2.6	.01	<i>v</i>
7721	1910 Mar. 15	Consid.	Consid. ferrug.	None	opa-que	19.8	11.1	.0310	.0088	.003	.0000	.91	9.3	1.60	<i>w</i>
7939	June 2	V. slight	S. silt	None	0.05	18.9	12.7	.0010	.0025	.0025	.0000	.47	4.6	.05	<i>i</i>

*t* Rain water from pond and spring; *u* filter No. 2; *v* receiving basin; *w* inlet pipe aerating tank; *x* brook from Page field (upper well); *i* catch basin No. 4 on long line.

*Examination of Water from Cochecho River, Proposed Public Supply.*

7766	1910 Apr. 1	Slight	Sl. floe.	Swam-py	0.50	7.3	1.0	.0036	.0110	.0040	.0000	0.29	.60	...	*
7767	Apr. 1	Slight	Sl. floe.	Swam-py	0.50	5.4	1.7	.0016	.0104	.0040	.0000	0.29	.90	...	*
7768	Apr. 1	Slight	Sl. floe.	Swam-py	0.50	9.8	.90	.0012	.0110	.0040	.0000	0.26	.70	...	*

*Examination of Water from Artesian Wells, Proposed Supply.*

7613	1910 Jan. 21	None	V. slight	None	0.00	6.0	4.5	.0010	.0060	.0100	.0000	.25	2.6	.01	..
8046	July 6	None	Med. silt	None	0.05	18.3	12.3	.0015	.0010	.0025	.0000	.75	4.6	.05	..

*Examination of Water from Kelley Springs.*

3754	1906 July 16	None	None	None	0.10	3.5	1.8	.0008	.0048	.0050	.0000	.20	.1	...	..
3836	Aug. 13	None	None	None	0.05	2.8	2.3	.0010	.0060	.0100	.0000	.22	.4	...	..
5326	1908 May 28	Mod'ate	Con. fer.	None	Clou- dy	7.7	3.5	.0006	.0150	.0060	.0000	.46	.4	1.25	<i>a</i>

\* *B. Coli* present; *a* when sampled the main was undergoing repairs.

**Dublin.**—No public supply. There are but very few wells in use at the present time in the town. The supply is very largely from springs and from the lake, which is fed by springs. There are five hydraulic rams and as many windmills, and several engines in use to pump water to the hilltops, where the summer residences are.

*Examination of Water from Dublin Pond.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
7942	1910 June 6	None	None	None	0.10	1.0	.50	.0010	.0055	.0025	.0000	.10	.4	.000

**Dunbarton.**—A private supply, inaugurated in 1904, furnishes water to three families and one public watering place from a spring excavated five feet deep in gravel. There is a standpipe of 100 barrels' capacity, from which the water is distributed through 1,300 feet of galvanized iron pipe, service and mains.

**Durham.**—Water is furnished to the college and to the village from five systems, all under separate management. The principal supply, known as the Durham Spring Water Company (Pettee supply) was inaugurated in 1893 and now consists of five dug and driven wells, the water of which is pumped to a standpipe of 7,000 gallons' capacity. One mile of distributing mains; about one half of the village is supplied from this source.

In 1892 the New Hampshire College of Agriculture and Mechanic Arts established a system for supplying the various college buildings, the source being a pond of nine acres. This supply has recently been augmented by a driven well 265 feet deep, capacity 40 gallons per minute. Water from both sources is pumped to a standpipe of 10,000 gallons' capacity. There is one-half mile of distributing mains.

The Durham Water Works, the only incorporated water company in town, was instituted in 1898 by J. W. Burnham. The source is a dug well twelve feet deep, the water being pumped to a standpipe of 4,000 gallons' capacity. About one tenth of the village is supplied from this source. Distributing mains, 1,000 feet.

The George Hoitt system consists of a dug well 10 feet deep, with



standpipe of 6,500 gallons. This supplies one fourth of the village. There are about 1,500 feet of distributing mains.

A system established by Charles Hoitt in 1906 supplies water to a few families, the source being a well. Distributing mains, 2,000 feet.

*Examination of Water from Faucet of Supply of C. H. Pettee.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
784	1902 Sept. 8	None	None	None	0.0	15.20	9.50	.0012	.0028	.3500	.0003	.58	5.5	....
1360	1903 July 21	Marked	Fine floc.	V. slight	0.15	12.80	6.70	.0000	.0000	.0500	.0001	.65	4.5	....
1981	1904 May 24	Slight	None	None	0.0	15.20	6.90	.0000	.0016	.2200	.0000	.60	4.7	....
2693	1905 Feb. 10	None	V. slight	None	0.10	10.60	7.9	.0110	.0010	.0500	.0000	.65	4.2	....
3099	Aug. 20	Mod. op.	Mod.	None	0.00	9.3	7.3	.0020	.0034	.0500	.0004	.33	....	*
3100	Aug. 20	S. op.	Slight	S. veg.	0.00	13.4	11.0	.0024	.0022	.0750	.0030	.56	....	*
3395	1906 Jan. 15	None	None	M. veg.	0.00	9.2	5.5	.0006	.0044	.0250	.0010	.52	2.3	....
4124	Nov. 3	None	None	None	0.05	11.8	9.3	.0006	.0040	.0400	.0000	.52	5.0	....
4215	Dec. 10	None	None	None	0.00	12.0	9.0	.0005	.0022	.1700	.0000	.65	6.5	....
4118	Dec. 10	Opal	Consid. earthy	Veg.	Opal	17.2	14.7	.0005	.0064	.0450	.0000	.53	6.5	....
4223	Dec. 10	V. slight	V. slight	Argil.	0.00	16.5	12.9	.0008	.0026	.0150	.0004	.55	....	....
4224	Dec. 10	V. slight	V. slight	Argil.	0.00	10.0	8.4	.0050	.0018	.0250	.0000	.45	....	....
5004	Nov. 5	V. slight	Sl. opal	None	0.00	10.4	8.6	.0006	.0010	.0450	.0000	.40	5.0	....
7682	1910 Mar. 2	Mark. opal.	Consid. earthy	Earthy	opaque	11.1	8.0	.0008	.0006	.0050	.0000	.83	5.4	....

\* B. Coli present.

*Examination of Water from Tap at College Creamery.*

4212	1906 Dec. 10	None	Slight	Argil.	0.00	13.0	10.0	.0008	.0020	.0150	.0000	.59	6.5	....
------	-----------------	------	--------	--------	------	------	------	-------	-------	-------	-------	-----	-----	------

*Examination of Water from the Charles Hoitt Supply.*

4219	1906 Dec. 10	None	None	Slight	0.00	8.5	6.5	.0010	.0024	.0200	.0000	.45	6.0	....
4220	Dec. 10	None	V. slight	None	0.00	10.0	8.0	.0006	.0024	.0180	.0000	.45	6.0	....



*Examination of Water from the Zeta House.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
4214	1906 Dec. 10	V. slight	V. slight	Argil.	0.00	12.5	7.5	.0005	.0030	.4500	.0000	1.90	....	....	*
7870	1910 May 4	Mod. opal.	Sl. ferrug.	Sl. foul	0.10	9.3	8.8	.0070	.0020	.2500	.0000	2.30	7.4	.010	..

*Examination of Water from Conant Spring, near Conant Hall.*

4213	1906 Dec. 10	None	V. slight	Argil.	0.00	10.0	7.2	.0030	.0024	.1200	.0000	.75	6.5	....	*
7867	1910 May 4	None	None	Musty	0.00	10.7	8.4	.0007	.0040	.050	.0000	.70	5.1	....	..

*Examination of Water from the New Artesian Well at New Hampshire College.*

7868	1910 May 4	Slight	Consid. ferrug.	Earthy	0.65	4.0	1.9	.0030	.0090	.0025	.0000	.35	.9	.10	..
------	---------------	--------	-----------------	--------	------	-----	-----	-------	-------	-------	-------	-----	----	-----	----

*Examination of Water from the Well near Gymnasium.*

7683	Mar. 2	V. faint	Slight	Earthy	0.00	8.6	5.1	.0014	.0056	.0050	.0000	.49	4.3	....	..
------	--------	----------	--------	--------	------	-----	-----	-------	-------	-------	-------	-----	-----	------	----

*Examination of Water from the Well of Carrie Buzzel.*

5939	1909 Jan. 18	Sl. opal	Mod. earthy	Earthy	0.05	.....	.....	.0010	.0050	.4000	.0000	4.7	7.9	....	..
7636	1910 Feb. 2	Slight	V. slight	None	0.00	.....	.....	.0070	.0080	.4000	.0004	1.7	8.9	.....	..

*Examination of Water from the Well of Gorham Sawyer.*

7686	Mar. 3	Mod.	Sl. coarse	Foul	0.10	60.2	49.7	.0030	.0038	.500	.0030	12.6	12.4	....	..
7628	Feb. 1	V. slight	V. slight	Sl. earthy	0.05	.....	.....	.0090	.0060	.700	High	10.6	12.4	....	*

\* B. Coli present.

*Examination of Water from the Well of A. L. Cummings.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
7670	1910 Feb. 23	None	None	None	0.05	.....	.....	.0008	.0010	.0400	.0005	1.8	10.3	.....

*Examination of Water from the Well of George Hoitt.*

7669	1910 Feb. 22	None	None	None	0.05	.....	.....	.0010	.0004	.0100	.0000	.45	5.6	.....
------	-----------------	------	------	------	------	-------	-------	-------	-------	-------	-------	-----	-----	-------

*Examination of Water from the Well of Edward Chesley.*

7630	1910 Feb. 2	Sl. opal	Slight	Foreign	0.10	.....	.....	.0010	.0045	.1000	.0000	.80	4.6	.....
------	----------------	----------	--------	---------	------	-------	-------	-------	-------	-------	-------	-----	-----	-------

**Enfield.**—The Enfield Village Fire District Water Works, built in 1902 and 1903, by Arthur W. Stone of Hartford, Vt., is owned by the precinct. The source of the supply is a pond of 21 acres in area, and an average depth of about eight feet, fed by springs. The watershed is about 2,000 acres, principally cleared land, with only two families living near. The water flows by gravity through four miles of iron pipe. Service pipes are lead. From one fourth to one third of the population are supplied from this system, with additional connections being made each week.

There are also two private systems of water works in town: the Mascoma Aqueduct Company, whose plant was built in 1884. This supply is from a spring two feet in depth, which supplies about 1,000 gallons daily. This is a gravity system, with one mile of lead main pipe, and also lead service pipe. Ten families are supplied with this water, but some of them also have the town water.

The other private system was built by the Enfield Aqueduct Company in 1854, the source being a well 16 feet deep. This, also, is a gravity system with three fourths of a mile of cement-lined lead pipe for a main, and lead service pipes. The average daily consumption from this system is 1,320 gallons, by 40 families, but the town water is also supplied to some of these patrons.

*Examination of Water from Village Fire District Water Works.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
2075	1904 June 20	V. slight	Slight	Dec. veg.	0.45	.....	.....	.....	.....	.0000	.0000	.15	4.1	.....
2411	Oct. 6	None	None	S. veg.	0.50	6.6	3.0	.0014	.0200	.0250	.0000	.05	1.2	.....
2910	1905 June 19	None	None	S. veg.	0.40	5.5	2.7	.0000	.0116	.0200	.0000	.12	1.6	.....
3095	Aug. 18	V. slight	None	S. veg.	0.50	5.7	2.7	.0020	.0152	.0100	.0000	.10	1.8	.....
3368	1906 Jan. 5	V. slight	None	None	0.40	4.5	2.2	.0016	.0074	.0050	.0000	.07	2.0	.....
3790	July 30	None	Slight	Veg.	0.40	4.8	2.0	.0022	.0168	.0000	.0000	.05	1.6	..... *
3790	July 30	None	S. fine	Veg.	0.4	4.8	2.0	.0022	.0168	.0000	.0000	.05	1.6	.....
4011	Sept. 28	Slight	Mod. fine	Mark'd veg.	.50	6.5	2.0	.0014	.0204	.0050	.0000	.07	1.9	..... *
4651	1907 June 21	None	V. slight	Earthy	.40	3.5	1.6	.0008	.0120	.0050	.0000	.05	1.5	.....
5601	1908 Sept. 14	Slight	V. slight	None	0.30	5.5	1.7	.0010	.0086	.0040	.0000	.12	1.5	.....
5860	Nov. 26	Slight	V. slight	Earthy	0.50	4.5	1.6	.0110	.0330	.0000	.0002	.06	1.5	..... *
5997	.....	None	None	Slight	0.30	.....	.....	.0160	.0140	.0100	.0000	.09	.....	.....
5998	.....	None	None	Slight	0.30	.....	.....	.0160	.0100	.0150	.0000	.08	.....	.....
7210	1909 July 22	H. fibre	.....	Pecul.	0.40	8.3	4.7	.0090	High	.0050	.0002	.05	1.2	..... *
7246	Aug. 5	V. slight	Sl. veg.	Consid. veg.	0.40	5.6	2.1	High	High	.0050	.0004	.05	1.4	.....
7247	Aug. 5	Consid. opal	Slight	Veg. opaque	0.70	8.0	2.5	Very high	Very high	.0050	.0000	.05	1.4	..... *
7306	Aug. 23	Mod. opal	Consid. flocc.	Marked veg.	0.70	7.0	3.2	Very high	Very high	.0050	.0000	.05	2.3	.....
7307	Aug. 23	Sl. opal.	Mod.	Veg.	0.30	.....	.....	High	High	.0050	.0000	.05	1.8	.....
7455	Oct. 18	Slight	V. slight	Slight	0.30	4.2	1.0	.0030	.0050	High	.0000	.05	1.2	.....
7930	1910 May 30	Sl. opal	None	Earthy	0.10	5.5	4.3	.0010	.0035	.0075	.0032	.07	3.5	..... †
8245	Aug. 1	Heavy	Heavy	Sweet	0.50	.....	.....	High	Very high	.0040	.0000	.08	1.8	.....

\* B Coli present. † .10 Zinc.

*Examination of Water from Tap of Mascoma Aqueduct Company.*

3079	1905 Aug. 14	Slight	Consid. earthy	Slight	0.00	4.3	3.0	.0000	.0000	.0100	.0000	.07	0.7	.....
3372	1906 Jan. 5	None	None	None	0.00	6.2	3.2	.0006	.0016	.0080	.0000	.05	1.1	.....
4116	Oct. 31	None	Slight	V. Sl.	0.15	4.5	2.7	.0006	.0040	.0050	.0000	.07	1.2	.065 ..

*Examination of Water from Tap of Enfield Aqueduct Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
3669	1906 Jan. 5	None	None	None	0.00	11.0	8.2	.0010	.0038	.0750	.0000	.62	6.3	.015	*
4115	Oct. 31	None	Marked	None	0.15	12.2	10.3	.0010	.0052	.0050	.0000	.35	5.3	....	..
4652	1907 June 21	Mod'ate	Mod'ate	Mod. veg.	0.40	10.6	8.2	.0066	.0060	.0050	Ft. tr.	1.18	6.0	Pres ent	*

*Examination of Water from the Well of Boston & Maine Railroad.*

8264	Aug. 4	Slight	Sl. floe.	Sl. veg.	0.70	.....	.....	.0020	.0050	.0050	.000	1.10	6.7	0	...
------	--------	--------	-----------	----------	------	-------	-------	-------	-------	-------	------	------	-----	---	-----

**Epping.**—Water for this town is furnished by private wells and springs. River water is furnished by the Village District Water System for use at the box shop, and several families have it for washing purposes.

*Examination of River Water, Village District Water System.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
4994	1907 Oct. 31	Slight	V. slight	S. earthy	0.80	4.7	1.5	.0002	.0110	.006	.0000	.34	0.9	....	*

*Examination of Water from Well of A. W. Mitchell (Semi-Public Supply).*

4455	1907 Apr. 22	V.S. opal	Mod. floe.	Slight	0.05	34.9	20.0	.0022	.0040	.75	.0007	6.18	7.4	....	*
------	-----------------	-----------	------------	--------	------	------	------	-------	-------	-----	-------	------	-----	------	---

\* B. Coli present.

**Exeter.**—No public supply. The Exeter Water Works, owned by a private company, were installed in 1886. The source of the supply is an artificial pond fed by springs and brook. (See special report elsewhere.)

*Examination of Water from Faucet of Supply of Exeter Water Works.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
749	1902 Aug. 26	V. slight	Decided red floc.	Mark. veg.	0.5	7.80	2.80	.0000	.0202	.0000	.0000	.37	2.8	....
1358	1903 July 20	None	Floc.	V. slight	0.4	8.20	1.50	.0000	.0096	.0000	.0000	.30	2.2	....
1959	1904 May 16	Marked	Much fine	Sl. veg.	0.5	6.70	3.60	.0000	.0144	.0050	.0000	.32	3.2	....
2209	July 26	Marked	V. Much red floc.	Slightly aromat.	0.5	7.50	4.70	.0006	.0108	.0050	.0000	.42	4.7	....
2670	1905 Jan. 30	Consid.	Slight	Dec. vg.	0.50	8.5	5.0	.0080	.0084	.0150	.0000	.45	2.4	....
3076	Aug. 14	Slight	S. ferrug.	M. veg.	0.30	9.2	5.5	.0000	.0124	.0050	.0000	.45	2.8	....
3381	1906 Jan. 9	Slight	Slight	Veg.	0.60	5.0	4.3	.0044	.0064	.0100	.0000	.57	2.3	....
4108	Oct. 29	Mod. op.	Mod. fer.	Stale	0.30	8.3	6.2	.0012	.0124	.0050	.0000	.55	3.2	.... *
4446	1907 Apr. 15	V. slight	V. slight	S. foul	0.10	5.5	3.5	.0020	.0028	.0050	.0000	.50	2.3	....
5146	1908 Feb. 27	S. opal	Marked earthy	V. slight	0.10	5.0	4.0	.0012	.0044	.0070	.0000	.57	1.9	....
5145	Feb. 27	Slight	Slight	Mark. earthy	0.10	4.8	3.0	.0004	.0036	.0070	.0000	.66	1.2	....
5144	Feb. 27	S. opal	Slight	Mark. earthy	0.05	4.5	3.0	.0006	.0034	.0030	.0000	.60	1.2	....
5143	Feb. 27	V. ft. op.	None	S. earthy	0.00	6.0	3.5	.0010	.0058	.0050	.0000	.65	1.2	....
5142	Feb. 27	Con. op.	S. earthy	Mark. earthy	Cl.	6.3	4.0	.0016	.0120	.0060	.0000	.68	0.4	.... *
5359	June 20	None	V. slight	Veg.	0.10	.....	.....	.0002	.0040	.0060	.0000	.12	3.2	....

\* B. Coli present.



**Farmington.**—Water is supplied from two systems, the earliest of which, owned by J. A. Fletcher, was established in 1898. The wells are twelve feet deep, the water being stored in an excavated reservoir of 100,000 gallons' capacity, from which it is distributed through 1,800 feet of cast iron mains.

In 1903 a supply was acquired by the town, the source also consisting of wells. The water is pumped to a reservoir of 900,000 gallons and is distributed through four miles of cast iron mains. Service pipe, galvanized iron.

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
853	1902 Oct. 10	None	Slight	V. slight	0.0	5.9	3.0	.0000	.0020	.0200	.0000	.45	3.0	....
3092	1905 Aug. 17	None	V. slight	None	0.0	17.0	11.3	.0030	.0010	.2500	.0010	3.15	4.4	.... *
3477	1906 Feb. 20	None	S. fibrous	None	0.0	15.3	12.3	.0014	.0014	.5000	.0005	2.52	4.4	....
4350	1907 Feb. 25	V. slight	Con. floc	Pecul.	0.05	.....	.....	.0054	.0036	.7500	Tr.	2.6	5.6	....
4937	1908 Oct. 10	None	None	None	0.00	19.2	14.9	.0012	.0016	.0400	Tr.	2.62	4.6	....
5225	1908 Apr. 14	None	None	None	0.00	14.5	8.5	.0006	.0018	.0400	V. ft. trace	2.66	4.6	....
5909	1908 Dec. 29	None	None	Mark. foul	0.10	7.1	4.4	.0080	.0070	.0100	Sl.tr.	.69	2.2	....
7095	.....	None	None	None	0.00	18.0	11.1	.0010	.0015	.6000	Sl.tr.	2.6	4.6	....
7909	1910 May 20	V. slight	S. earthy	V. S. earthy	0.00	3.9	2.2	.0010	.0020	.0050	.0000	.30	.90	....

\* B. Coli present.

### *Examination of Water from Cold Spring.*

6051	1909 Mar. 22	None	None	None	0.05	3.5	2.3	.0010	.0015	.0400	.0000	.23	.4	....
7218	July 26	V. slight	Sl. floc.	None	0.20	3.5	2.2	.0002	.0050	.0000	.0000	.05	.7	....

### *Examination of Water from the Artesian Well of Farmington Shoe Manufacturing Company.*

5599	1908 Sept. 3	Heavy	Cons. earthy	Slight	opa-que	.....	.....	.0036	.0002	.0060	.0000	1.83	3.9	....
------	-----------------	-------	--------------	--------	---------	-------	-------	-------	-------	-------	-------	------	-----	------

**Fitzwilliam.***Examination of Water from the Well of Baptist Church Society.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
7336	1909 Sept. 12	V. faint	Slight	None	0.10	.....	.....	.0010	.0070	High	.0000	2.50	4.6	.....

**Franeestown.**—A private supply, inaugurated 25 years ago, is from a spring. The watershed is cleared, but no inhabitants. Wells are excavated 12 feet deep, and the water flows by gravity through half a mile of enameled iron pipe, both service and mains. Twenty families have this water, one tenth of the population. There are private wells within this area.

*Examination of Water from Spring Reservoir.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
783	1902 Sept. 6	None	None	V. slight	0.00	8.5	4.0	.0000	.0000	.3000	.0000	.10	2.7	....
3084	1905 Aug. 15	None	None	None	0.07	7.0	4.6	.0008	.0008	.0920	.0000	.15	1.8	.... *
5360	1908 June 20	None	None	None	0.05	.....	.....	.0002	.0006	.0150	.0000	.09	2.6	....
5902	Dec. 23	None	None	None	0.00	5.0	2.5	.0008	.0001	.0500	.0000	.19	.6	....
7769	1910 Apr. 4	None	Slight	Sl. earthy	0.00	5.5	2.9	.0012	.0004	.0020	.0000	.16	2.4	....

\* B. Coli present.

**Franconia.**—No public supply. A private company, known as the Franconia Water Supply Company, in 1888 or 1889, introduced a water supply from a spring a mile and a half distant. A later supply, introduced in 1907 by Whipple and Priest, is taken from the Gale River Spring.

*Examination of Water of the Franconia Water Supply Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
387	1902 Feb. 1	None	Floc.	Earthy veg.	0.2	5.90	1.30	.0000	.0086	.0210	.0000	.10	1.3	....
1357	1903 July 19	None	None	None	1.0	6.70	2.00	.0000	.0000	.0200	.0000	.05	1.8	....
2678	1905 Feb. 1	None	M. fine	None	0.05	6.1	3.9	.0000	.0000	.0600	.0000	.25	1.6	....
3390	1906 Jan. 11	None	S. fine	S. veg.	0.10	7.3	4.8	.0010	.0026	.0300	.0000	.30	2.2	....
4177	Nov. 20	None	V. slight	None	0.20	4.5	3.0	.0010	.0094	.0400	.0000	.22	2.4	....
4664	1907 June 24	None	S. coarse	Mark. swampy	0.40	5.5	3.2	.0004	.0040	.0050	.0000	.07	1.1	.... *
4665	June 24	None	None	V. slight	0.00	.....	.....	.0002	.0006	.0500	.0000	.88	1.9	.... *
5977	1909 Feb. 5	None	None	None	0.00	5.8	4.6	.0010	.0002	.0750	.0000	.08	1.4	....

\* B. Coli present.

*Examination of Water from Gale River Spring.*

4958	1907 Oct. 15	None	V. slight	None	0.00	4.5	2.6	.0002	.0014	.0020	.0000	.11	1.9	....
5229	1908 Apr. 13	None	None	None	0.00	4.5	2.5	.0002	.0004	.0080	.0000	.06	1.9	....
7799	1910 Apr. 13	None	None	None	0.00	3.6	2.0	.0010	.0054	.0030	.0000	.40	1.5	....

*Examination of Water from Lafayette Brook (near Profile House).*

7347	1909 Sept. 9	None	None	None	0.00	.....	.....	.0010	.0015	.0100	.0000	.10	.4	....
8032	1910 July 5	None	V. slight	None	0.00	.....	.....	.0004	.0030	.0050	.0000	.10	.4	....

**Franklin.**—The Franklin Water Works, owned by the city, were built in 1891. The source consisted originally of springs, the water being pumped into a covered reservoir about 20 feet deep. Later, to obviate the necessity for direct pumpage from the Pemigewasset River during periods of drouth, a series of driven and tubular wells was constructed along the river bank. During 1906 the supply was further augmented by the construction of some catch basins which serve to collect the water from an extensive springy area lying at the base of a hill. In 1909 a system of filtration was established, the water being pumped from the river upon a sandbed, thence draining into a storage well. (This system will be found described elsewhere in this report.)

*Examination of Water from Franklin Town Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
78	1901 July 24	None	None	None	0.0	3.90	2.70	.0036	.0052	.0200	.0000	.14	....	.010 ..
337	Dec. 20	None	None	S. veg.	0.05	3.40	2.10	.0008	.0034	.0400	.0000	.18	0.8	.... ..
338	Dec. 20	None	None	S. veg.	0.05	4.00	2.40	.0014	.0050	.0220	.0000	.16	0.8	.... ..
804	1902 Sept. 15	None	None	None	0.0	6.50	3.30	.0000	.0016	.0200	.0000	.27	2.0	.... ..
849	Oct. 8	None	None	None	0.0	.....	.....	.....	.....	.0200	.0000	.....	.....	.000 ..
870	Oct. 15	None	None	None	0.0	.....	.....	.....	.....	.0300	.0000	.17	....	.087 ..
986	1903 Jan 14	None	None	S. veg.	0.0	9.10	3.20	.0000	.0010	.0200	.0000	.15	1.2	.000 ..
1166	Apr. 27	None	None	None	0.0	3.60	1.60	.0000	.0000	.0100	.0000	.15	1.6	.056 ..
1288	July 1	None	None	S. veg.	0.0	6.20	2.20	.0000	.0016	.0200	.0000	.15	1.8	Tr. ..
1351	July 20	None	None	None	0.0	4.40	2.60	.0000	.0014	.0000	.0000	.20	1.4	.... ..
1599	Oct. 15	None	None	V. slight	0.0	5.10	1.20	.0000	.0040	.0300	.0000	.15	1.1	.040 ..
1699	Nov. 24	None	None	Aro- matic.	0.0	3.50	2.00	.0006	.0070	.0000	.0000	.20	1.2	.008 ..
1702	Nov. 24	None	None	None	0.05	4.20	2.70	.0010	.0060	.0000	.0000	.20	1.8	.013 ..
1724	Dec. 15	None	None	S. veg.	0.0	4.90	3.00	.0000	.0012	.0400	.0001	.30	1.9	.... ..
1725	Dec. 15	Marked	M. floc. veg.	V. S.	0.05	3.40	1.60	.0020	.0070	.0100	.0000	.15	1.5	.... ..
1754	Dec. 22	V. slight	None	S. veg.	0.1	3.80	2.50	.0000	.0014	.0000	.0000	.25	1.6	.009 ..
1844	Feb. 18	None	S. veg.	None	0.0	3.00	2.00	.0006	.0016	.0050	.0000	.15	1.8	.... ..
1879	Mar. 29	Slight	V. slight	S. veg.	0.1	4.80	2.10	.0006	.0022	.0800	.0000	.15	1.6	.... ..
1922	May 5	None	None	S. veg.	0.05	5.20	3.00	.0024	.0026	.0250	.0000	.20	1.8	.... ..
2093	June 27	Slight	None	V. slight	0.0	2.50	.90	.0010	.0024	.0000	.0000	.20	1.0	.... ..

*Examination of Water from Franklin Town Supply—Continued.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
2435	1903 Oct. 12	None	None	V. slight	0.00	3.8	2.7	.0000	.0010	.0000	.0000	.20	1.8	....	*
2460	Oct. 20	None	None	V. slight	0.00	4.4	3.4	.0000	.0014	.0000	.0000	.22	1.8	....	*
2540	Nov. 15	None	None	V. slight	0.05	4.3	3.5	.0000	.0000	.0250	.0000	.22	1.1	....	e
2544	1904 Nov. 16	None	None	None	0.00	4.5	2.7	.0000	.0000	.0350	.0000	.22	1.1	....	e
2550	Nov. 18	Slight	S. fine	M. veg.	0.00	4.8	3.3	.0000	.0000	.0800	.0000	.22	1.4	....	f
2589	Dec. 12	None	None	S. earthy	0.00	7.5	6.0	.0000	.0010	.0150	.0000	.25	1.2	....	*
2599	Dec. 19	None	Consid. fine	S. earthy	0.00	6.0	3.0	.0000	.0000	.0400	.0000	.25	1.6	....	f
2622	1905 Jan. 2	None	S. fine	S. earthy	0.00	4.3	3.0	.0000	.0000	.0280	.0000	.25	1.1	....	..
2647	Jan. 17	Slight	M. flocc.	None	0.25	4.8	3.5	.0000	.0000	.0150	.0000	.20	0.6	....	h
2649	Jan. 17	None	None	Slight	0.15	4.4	2.9	.0000	.0024	.0100	.0000	.15	0.4	....	*j
2650	Jan. 17	V. slight	Consid. flocc.	Veg.	0.30	3.7	2.9	.0020	.0010	.0150	.0000	.17	0.9	....	k
2683	Feb. 7	None	V. slight	None	0.05	9.2	6.9	.0000	.0000	.0550	.0008	.25	2.7	....	l
2667	Jan. 30	Slight	S. flocc.	V. slight	0.15	5.0	3.0	.0000	.0010	.0200	.0000	.15	1.4	....	m
2694	Feb. 13	None	S. flocc.	V. slight	0.00	4.0	2.8	.0010	.0010	.0300	.0000	.30	2.2	....	n
2709	Feb. 20	Slight	M. flocc.	S. foul	0.20	4.2	3.0	.0094	.0000	.0300	.0001	.22	0.6	....	o
2747	Mar. 13	None	V. slight	S. musty	0.00	8.0	6.0	.0000	.0014	.0300	.0000	.85	3.1	.110	p
1767	Mar. 27	None	M. flocc.	S. earthy	0.05	4.0	3.1	.0000	.0000	.0280	.0000	.20	1.6	....	*q
2773	Mar. 29	Much	Consid.	S. musty	0.20	4.6	2.0	.0010	.0010	.0250	.0000	.20	1.2	....	..
2778	Mar. 30	None	S. fine	Slight	0.10	4.9	3.4	.0014	.0014	.0250	.0000	.20	1.6	....	..
2782	Mar. 31	None	Consid.	S. earthy	0.10	4.5	3.0	.0000	.0000	.0200	.0000	.20	1.6	....	..
2784	Apr. 1	None	Consid.	None	0.10	4.5	2.6	.0014	.0000	.0200	.0000	.20	1.1	....	..
2787	Apr. 3	None	Consid.	None	0.10	4.5	2.7	.0014	.0010	.0200	.0000	.20	1.1	....	..
2789	Apr. 4	None	V. slight	None	0.05	4.5	3.0	.0014	.0010	.0150	.0000	.20	1.1	....	..
2792	Apr. 6	Slight	Slight	Slight	0.10	4.2	2.3	.0000	.0014	.0150	.0000	.20	1.1	....	..
2810	Apr. 24	None	Slight	None	0.10	4.0	2.3	.0000	.0014	.0150	.0000	.22	1.2	....	*
2837	May 10	None	V. slight	Veg.	0.00	5.8	3.8	.0000	.0000	.0250	.0000	.22	1.4	....	..
2842	May 11	None	Consid.	V. slight	0.00	13.7	8.2	.0000	.0010	.0250	.0000	.25	6.2	....	..
2847	May 13	Slight	S. flocc.	Slight	0.00	5.1	3.2	.0010	.0000	.0300	.0000	.20	1.1	....	..
2849	May 15	None	V. slight	V. slight	0.00	5.1	3.1	.0000	.0000	.0300	.0000	.20	1.1	....	..
2850	May 16	None	None	None	0.10	5.1	3.3	.0000	.0000	.0300	.0000	.20	1.1	....	..
2853	May 17	None	V. slight	None	0.00	5.7	3.7	.0000	.0000	.0300	.0000	.20	1.2	....	..
2854	May 18	None	V. slight	Earthy	0.00	5.7	2.8	.0010	.0000	.0200	.0000	.20	1.1	....	..



*Examination of Water from Franklin Town Supply.—Concluded.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
2857	1905 May 19	None	None	None	0.00	5.80	4.0	.0010	.0000	.0200	.0000	.20	1.2	.....
2860	May 22	Slight	Slight	V. slight	0.05	9.7	6.2	.0000	.0000	.5000	.0000	.93	2.7	..... <i>u</i>
2862	May 22	None	Slight	Slight	0.05	5.1	3.4	.0000	.0000	.1000	.0000	.32	1.4	..... <i>v</i>
3047	Aug. 4	Slight	None	None	0.00	5.7	3.3	.0010	.0016	.0200	.0000	.22	1.2	.....
3196	Sept. 26	V. slight	V. slight	S. earthy	0.10	4.9	3.6	.0006	.0060	.0100	.0000	.22	1.8	.....
3202	Sept. 27	None	None	None	0.10	4.7	2.8	.0008	.0054	.0200	.0000	.22	1.8	.....
3231	Oct. 17	None	None	S. veg.	0.15	4.6	2.9	.0020	.0084	.0100	.0000	.22	1.5	.....
3345	Dec. 23	None	None	Veg.	0.05	4.1	2.8	.0022	.0038	.0100	.0000	.20	1.9	.....
3347	Dec. 28	M. opal	Con. floc.	M. veg.	0.18	9.1	7.0	.0040	.0034	.0250	.0010	.22	4.2	..... <i>w</i>
3348	Dec. 28	V. slight	V. slight	S. veg.	0.05	6.0	4.5	.0008	.0030	.0250	.0000	.22	2.0	.....
3355	1906 Jan. 2	None	None	None	0.00	4.8	3.5	.0010	.0034	.0250	.0000	.22	2.7	.....
3366	Jan. 5	None	None	None	0.05	4.1	2.4	.0010	.0034	.0100	.0000	.22	1.5	.....
3375	Jan. 9	None	None	None	0.00	5.3	3.8	.0010	.0014	.0280	.0000	.22	2.0	.....
3401	Jan. 18	None	None	None	0.00	5.1	3.6	.0010	.0034	.0200	.0000	.22	2.2	.....
3412	Jan. 25	None	None	None	0.05	5.3	3.6	.0000	.0024	.0200	.0000	.20	1.4	..... *
3429	Feb. 1	None	None	None	0.00	5.3	3.2	.0008	.0010	.0200	.0000	.22	1.2	.....
3591	May 2	None	None	None	0.00	8.0	2.5	.0014	.0014	.0400	.0000	.22	1.4	.....
4035	Oct. 2	Sl. opal	V. slight	None	0.10	6.5	3.5	.0014	.0030	.0100	.0000	.10	1.9	..... *
4411	1907 Apr. 8	Sl. opal	Slight	None	0.00	4.1	2.4	.0012	.0014	.0000	.0000	.23	1.6	.....
4557	May 22	None	Slight gelatinous	None	0.05	4.5	3.1	.0020	.0022	.0050	.0000	.20	1.6	.....
4667	June 25	None	S. fine	None	0.00	4.6	3.5	.0002	.0006	.0050	.0000	.30	1.9	..... *
4897	Sept. 23	None	None	None	0.00	4.5	3.4	.0002	.0030	.0000	.0000	.10	1.2	.....
5187	1908 Mar. 24	Mod. opal	Slight	None	0.5	4.0	2.7	.0002	.0028	.0030	.0000	.18	1.2	.....
5647	Sept. 18	V. slight	V. slight	None	0.10	5.3	0.0	.0002	.0004	.0100	.0000	.16	.9	.....
5846	Nov. 17	None	Sl. ferrug.	None	0.10	3.3	1.8	.0005	.0010	.0100	.0000	.17	1.6	.....
6058	1909 Mar. 26	Marked	Med. earthy	Mark. earthy	Opa que	6.4	4.5	.0008	.0025	.0100	.0000	.12	1.1	.....
7767	1910 Apr. 5	Slight	Cons. floc.	Sl. earthy	0.05	4.5	3.6	.0010	.0016	.0050	.0000	.14	3.2	..... *
7862	May 4	None	Mod. ferrug.	V. Sl. earthy	0.05	3.7	2.9	.0005	.0015	.0075	.0000	.12	1.5	.....
7880	May 11	V. slight	None	None	0.05	.....	.....	.0005	.0010	.0100	.0000	.15	1.2	.....

\* B. Coli present; *e* test well No. 8; *f* driven well No. 9; *h* Ward's Brook; *j* Webster Lake; *k* Giles Brook; *l* well No. 4; *m* well No. 16; *n* well No. 5; *o* well No. 7; *p* spring; *q* all the wells after being pumped 24 hours; *u* brick wall; *v* wood covered reservoir; *w* large well.

In addition to the above, a number of special examinations have been made for colon bacilli.

**Goffstown.**—The present system was built in 1891 by the Goffstown Fire Precinct, Goffstown Village. The reservoir from which the water supply comes is situated between the Uncanoonuc Mountains and is surrounded by woodland. The reservoir is fed by springs in the bottom of the reservoir; by a brook, fed by springs flowing from the northeastern slope of the north mountain, and from a swamp flowing into the brook near the mouth of the reservoir. In addition to the above there has recently been built a storage reservoir of larger capacity than this one; both are at the base of Uncanoonuc Mountains. The quality of the supply has recently improved, the color being much reduced.

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
201	1901 Oct. 10	None	Floc.veg.	Dec. vg.	1.40	5.60	2.20	.0042	.0276	.0000	.0002	.17	...	...
795	1902 Sept. 11	None	None	Dec. vg.	1.90	8.70	2.00	.0028	.0234	.0000	.0002	.11	2.0	...
1388	1903 July 29	Slight	Floc.veg.	Dec. vg.	1.1	8.00	1.10	.0014	.0202	.0000	.0000	.16	0.9	...
1962	1904 May 17	None	None	V. slight veg.	0.9	4.20	1.80	.0000	.0080	.0000	.0000	.13	1.7	...
2666	1905 Jan. 30	None	None	S. veg.	1.30	6.0	2.6	.0000	.0120	.0000	.0000	.15	0.7	...
3154	1905 Sept. 9	None	None	Veg.	2.20	9.3	2.6	.0010	.0314	.0100	.0000	.10	1.5	...
3370	1906 Jan. 10	None	None	Veg.	0.80	4.8	2.0	.0014	.0024	.0100	.0000	.10	0.9	...
4174	1906 Nov. 21	None	None	None	0.30	4.3	2.8	.0014	.0070	.0100	.0000	.25	0.4	...
4448	1907 Apr. 16	None	V. slight	None	0.10	2.5	0.9	.0010	.0028	.0050	.0000	.23	0.4	...
4965	1907 Oct. 18	None	None	None	0.20	3.2	2.3	.0012	.0096	.0040	.0000	.15	0.4	...
5233	1908 Apr. 15	None	None	None	0.00	2.5	1.0	.0004	.0014	.0060	.0000	.10	0.4	...
5430	1908 July 20	V. ft. op.	Slight	Mk. foul	0.10	3.0	1.7	.0008	.0062	.0120	.0000	.11	1.8	...
5899	1908 Dec. 23	None	None	Sl. arom.	0.70	6.4	3.5	.0015	.0150	.0000	.0000	.17	.9	...
7780	1910 Apr. 11	None	Sl. floc.	Sl. earthy	0.70	2.3	.80	.0004	.0050	.0020	.0000	.12	.1	...

*Examination of Water from Hillsborough County Farm.<sup>1</sup>*

5983	1909 Feb. 10	None	V. slight	Mod. earthy	0.10	4.1	2.3	.0015	.0025	.0400	.0000	.33	.7	...
------	-----------------	------	-----------	----------------	------	-----	-----	-------	-------	-------	-------	-----	----	-----

<sup>1</sup> Pumped from Piscataquog River.

**Gorham.**—No public supply. The Alpine Aqueduct Company, organized in 1873, furnishes water to 160 families, one half the population, from 19 springs, three to seven feet deep, stoned and covered.

*Examination of Water from a Faucet of the Alpine Aqueduct Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
799	1902 Sept. 11	None	None	None	0.0	7.40	4.80	.0000	.0000	.0000	.0000	.10	1.9	....
1352	1903 July 18	None	None	None	0.0	5.80	1.20	.0000	.0014	.0000	.0000	.05	1.1	....
1957	1904 May 15	None	None	V. slight	0.0	4.80	3.70	.0014	.0030	.0000	.0000	.07	2.0	....
2672	1905 Jan. 30	None	None	None	0.05	6.0	4.3	.0000	.0000	.0200	.0000	.07	1.6	....
2813	Apr. 24	None	S. veg.	None	0.28	5.5	2.3	.0000	.0014	.0250	.0000	.15	0.7	.... a
2814	Apr. 24	None	Slight	None	0.28	4.5	2.4	.0000	.0022	.0000	.0000	.07	0.1	.... b
2815	Apr. 24	None	None	None	0.00	5.0	3.3	.0000	.0008	.0100	.0000	.15	0.7	....
2816	Apr. 24	None	V. slight	None	0.10	4.8	3.1	.0000	.0010	.0000	.0000	.05	0.4	.... c
3204	Sept. 27	None	Slight	None	0.10	5.1	3.1	.0007	.0020	.0100	.0000	.05	1.2	....
3385	1906 Jan. 10	None	None	None	0.00	4.4	2.7	.0014	.0010	.0100	.0000	.05	1.5	....
4112	Oct. 30	None	None	Mark. veg.	0.05	5.7	2.8	.0008	.0048	.0050	.0000	.07	1.2	....
4436	1907 Apr. 15	None	V. slight	Aro- matic	0.10	3.1	2.0	.0016	.0020	.0200	.0000	.05	1.2	....
4939	Oct. 9	None	None	None	0.35	1.8	1.2	.0008	.0044	.0030	.0000	.15	0.9	....
7071	1909 June 1	None	None	None	0.20	3.3	1.8	.0005	.0040	.0200	.0000	.11	.4	....
7285	Aug. 18	None	None	None	0.00	5.0	3.2	.0001	.0001	.0050	.0000	.07	1.6	....
7791	1910 Apr. 11	None	Sl. earthy	Earthy	0.10	3.2	1.8	.0010	.0070	.0500	.0000	.07	.6	....

a Perkins Brook; b South Branch of Moose Brook; c Ice from Gulch Brook.

**Greenfield.**—During 1910 the town voted to appropriate \$200 for establishing a watering trough and drinking fountain, and an analysis was secured of the proposed supply. At this time, however, nothing further has been done in the matter.

*Examination of Water for Proposed Drinking Fountain.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
7924	1910 May 26	None	V. slight	None	0.00	8.0	.....	.0010	.0010	.0450	.0000	.35	3.6	....	*

*Examination of Water from the Well of Boston & Maine Railroad.*

7897	May 17	None	None	None	0.00	.....	.....	.0050	.0125	.0100	.0000	.50	2.0	....	..
------	--------	------	------	------	------	-------	-------	-------	-------	-------	-------	-----	-----	------	----

\* B. Coli present.

**Greenville.**—The town owns and operates a small water supply in the form of an artesian well 425 feet deep, ending in solid rock, and most of the distance below 125 feet in solid rock. The water is pumped to a brick reservoir of 20,000 gallons' capacity. There is one mile of wood main pipe, while the service pipes are of galvanized iron. Sixteen families and two schools take from this supply, 25 per cent. of the population. There are many private wells within this area, but none to which the public have access.

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
753	1902 Aug. 27	None	None	None	0.00	12.40	8.7	.0000	.0000	.0200	.0000	.12	3.9	....
2699	1905 Feb. 14	Much	Slight	V. slight	0.10	11.5	10.0	.0020	.0000	.0000	.0000	.15	3.9	....
2970	July 10	V. slight	Slight	S. foul	0.15	12.3	9.9	.0008	.0016	.0120	.0000	.17	4.5	....
3135	Sept. 1	V. slight	S. opal	Clayey	....	12.2	7.1	.0022	.0022	.0000	.0000	.16	4.0	....
3400	1906 Jan. 18	Heavy	Consid. ferrug.	None	0.50	17.8	13.5	.0014	.0074	.0050	.0005	.22	4.6	....
3417	Jan. 29	V. slight	None	None	0.10	13.3	8.5	.0014	.0034	.0050	.0001	.27	4.3	....
3649	May 31	M. opal	None	Veg.	0.20	13.5	9.8	.0010	.0014	.0050	.0000	.10	....	....
4123	Nov. 2	Slight	S. fine	S. veg.	0.10	14.0	10.1	.0008	.0036	.0050	.0000	.10	4.5	....
5966	1909 Feb. 3	Heavy	Sl. earthy	Mark.	0.40	13.6	9.4	.0040	.0030	.0200	.0000	.15	3.9	.... *
5996	Feb. 19	Mod. opal	V. slight	None	0.10	10.7	7.3	.0360	.0020	.0100	.0000	.16	3.7	....

\* B. Coli present.



**Hampton.**—In 1907 the Hampton Water Works Company constructed and put in operation at the Hampton Beach Village Precinct a system of water works, the source being 13 driven wells from 16 to 21 feet deep. Located at the so-called Gill's Spring, with a collecting basin 16 feet deep. The rate of water flow is 260 gallons. The geological formation is gravel and coarse, sharp sand.

Water is pumped to steel standpipe 15 feet by 90 feet, located on Great Boar's Head. There are four miles of cast-iron distributing mains, while the service pipes are of galvanized wrought iron.

One hundred and thirty families are using the supply, which constitute, approximately, 50 per cent. of the population of the locality.

*Examination of Water from Hampton Water Works Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
4654	1907 June 20	None	Slight	Earthy	0.00	10.3	7.8	.0012	.0002	.0150	.0000	1.34	3.6	.....
4655	June 20	None	S. fine	Earthy	0.00	9.6	7.5	.0004	.0002	.0050	.0000	1.25	3.2	.....
4774	July 30	S. opal	S. fine	Aroma- tic	Cl.	10.5	9.7	.0016	.0028	.0100	High	1.35	4.6	..... *
5238	1908 Apr. 24	None	More earthy	Veg.	0.05	8.8	6.3	.0004	.0002	.0050	.0000	1.21	3.1	.....
5383	June 26	None	None	None	0.10	10.3	6.7	.0010	.0004	.0500	.0000	1.40	3.9	.....
5385	June 26	V. slight	None	S. foul	0.05	8.5	5.0	.0002	.0002	.0750	.0000	1.46	3.2	.....
5510	Aug. 13	None	None	None	0.00	13.5	.....	.0016	.0002	.2000	.0006	1.40	3.7	.....
5511	Aug. 13	None	None	Foul	0.00	24.8	.....	.0064	.0020	.0750	.0007	9.60	4.6	.....
8277	1910 Aug. 5	None	None	None	0.00	10.7	6.4	.0010	.0010	.0500	.0000	1.35	3.9	.....

*Examination of Water from Town Pump.*

7176	1909 July 9	None	None	Sl. foul	0.00	.....	6.8	.0010	.0015	.250	.0000	1.70	4.	..... *
------	----------------	------	------	----------	------	-------	-----	-------	-------	------	-------	------	----	---------

*Examination of Water from the Wells Supplying Casino.*

5591	1908 Aug. 31	Slight	V. slight	Mark. foul	0.00	33.0	22.4	High	.0010	.0030	trace	10.79	5.3	..... a
8155	1910 July 19	None	V. slight	None	0.05	.....	.....	.0004	.0030	.150	.0000	2.7	3.2	..... b

a Casino wells by steam pump; b Well back of Casino.

**Hancock.**—A new supply, instituted in 1907, is obtained from Eaton's Brook. The latter is impounded by a dam and the resulting reservoir, located about two miles from the village, consists of a deep and narrow ravine, which was completely denuded of surface debris before flowing. Its capacity is 2,000,000 gallons. The mains are of iron, with galvanized iron service pipe. Twenty-five families, equivalent to about 75 per cent. of the village population, now use this supply.

*Examination of Water from Eaton's Brook and Tributaries.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites				
3040	1905 Aug. 1	None	S. veg.	Con. veg.	0.30	5.0	3.0	.0008	.0072	.0300	.0000	.10	1.1	....	*
3055	Aug. 6	None	V. slight	Slight	0.15	10.4	5.0	.0006	.0036	.0150	.0000	.10	1.1	....	*
3123	Aug. 30	None	None	None	0.05	4.0	2.1	.0030	.0038	.0100	.0000	.06	....	....	*
3391	1906 Jan. 15	None	S. coarse	None	0.10	3.8	2.2	.0010	.0064	.0100	.0000	.10	0.03	....	..
4104	Oct. 28	None	V. slight	S. veg.	0.30	4.5	3.0	.0014	.0124	.0050	.0000	.05	1.2	....	*
4388	1907 Mar. 27	Consid.	Mod. earthy	Swampy	0.20	3.1	1.7	.0004	.0004	.0220	.0000	.13	0.4	....	*
4394	Apr. 3	None	V. slight	V. slight	0.15	4.2	2.0	.0012	.0034	.0200	.0000	.13	0.4	....	..
4463	Apr. 25	None	S. fine	None	0.12	5.3	2.4	.0012	.0030	.0070	.0000	.14	1.6	....	..
4940	Oct. 10	None	None	None	0.25	2.1	1.5	.0010	.0042	.0030	.0000	.20	1.2	....	..
5265	1908 Apr. 29	None	None	V. slight	0.10	3.9	2.5	.0004	.0034	.0120	.0000	.09	0.4	....	..
5962	1909 Feb. 3	V. ft. opal	V. slight	None	0.10	4.6	3.0	.0020	.0020	.005	.0000	.09	1.5	....	..
7657	1910 Feb. 14	V. slight	Sl. fibre	Sl. earthy	0.08	2.9	2.4	.0004	.0054	.0050	.0000	.11	.6	....	..
7787	Apr. 11	None	V. slight	V. slight	0.20	2.3	1.4	.0006	.0100	.0020	.0000	.17	.6	....	a*

\* B. Coli present. a. .10 zinc.

**Hanover.**—The Hanover Water Works, installed in 1893, is an impounded water in a large artificial pond. The bed of the pond was a fertile valley, which was not cleared of vegetation before impounding the water. The water has always been colored, rich in dissolved vegetable matter, with occasionally some little taste and odor, though usually not offensive.

The Hanover Aqueduct Association, a private corporation, furnishes a water that is used largely, though not exclusively, for drinking purposes. It is a normal spring water, the wells being eight or nine in number and dug to a depth of 10 to 20 feet, and yielding 4,000 gallons per day. There are very few individual wells in this locality.

There are about 100 taps in operation on this aqueduct. The main is two-inch lead pipe, and the service pipes are generally one-half inch lead; water is served through pinhole gauges presumed to deliver 40 gallons daily.

*Examination of Water from Supply of the Hanover Water Works Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
...	1893 Oct. 29	Marked	Much	.....	Faint yel. br.	8.10	4.00	.0170	.0240	.0000	.0000	...	2.9	...	a
...	Nov. 27	Marked	.....	.....		7.20	2.68	.0080	.0170	.0000	.0000	...	2.7	...	b
...	Dec. 29	Faint	.....	.....		6.08	3.16	.0038	.0178	.0000	.0000	.10	2.7	...	c
...	1894 Jan. 26	None	None	.....	0.7	8.50	...	.0088	.0224	.0000	.0000	.26	...	...	d
...	Feb. 8	None	None	Foul	0.7	8.50	4.60	.0010	.0132	.0000	.0000	.20	4.1	...	e
...	Mar. 8	None	None	Slight	0.3	10.00	5.70	...	...	...	...	.40	1.9	...	f
...	Apr. 10	Slight	.....	.....	0.3	4.88	1.80	...	...	.0400	.0000	.16	...	...	..
...	Dec. 27	.....	.....	.....	0.7	...	...	.0003	.0250	.0200	.0000	.05	2.9	...	g
...	1896 Mar. 20	.....	.....	.....	0.5	5.28	2.64	.0066	.0180	.0000	.0000	.10	1.4	...	..
798	1902 Sept. 11	V. slight	Sl. veg.	V. dec. and earthy	0.55	8.80	3.30	.0020	.0230	.0000	.0000	.09	2.2	...	..
1353	1903 July 20	Marked	V. much floc.	V. mark veg.	0.5	7.80	2.20	.0010	.0240	.0000	.0000	.10	2.2	...	..
1384	July 29	Marked	Floc veg.	Decay- ed veg.	0.2	7.70	2.50	.0010	.0214	.0000	.0000	.07	2.0	...	..
1385	July 29	Marked	Floc. veg.	Decay- ed veg.	0.2	8.10	2.40	.0010	.0216	.0000	.0000	.07	2.1	...	..

*Examination of Water from Supply of the Hanover Water Works Company.—Concluded.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
1838	1904 Feb. 16	Slight	Fine floc.	V. slight	0.6	8.60	3.20	.0208	.0184	.0000	.0000	.10	2.6	....
1839	Feb. 16	Marked	Cpn. fine	Slight veg.	0.6	8.20	3.80	.0218	.0184	.0000	.0000	.10	2.7	....
1840	Feb. 16	Slight	Con. floc	Veg.	0.6	.....	.....	.0218	.0184	.0000	.0000	.10	2.7	....
1865	Mar. 8	Slight	Slight	Mark'd veg.	0.4	10.10	2.00	.0104	.0126	.0000	.0000	.10	2.2	.... <i>h</i>
1866	Mar. 9	Marked	Slight	Mark'd veg.	0.5	9.60	2.50	.0236	.0152	.0000	.0000	.15	2.2	....
1886	Apr. 4	V. slight	None	Mark'd veg.	0.3	4.90	2.40	.0000	.0036	.0000	.0000	.10	2.3	.... <i>i</i>
1887	Apr. 4	V. slight	None	Mark'd veg.	0.3	6.20	2.80	.0006	.0052	.0000	.0000	.10	2.4	.... <i>j</i>
3148	1905 Sept. 6	Slight	Slight	Veg.	0.50	8.3	3.6	.0016	.0160	.0200	.0000	.07	2.7	....
3267	Sept. 31	V. slight	V. S. fine	S. veg.	0.20	6.3	3.1	.0018	.0112	.0100	.0000	.10	2.8	....
3268	Oct. 31	Slight	Slight	S. veg.	0.40	6.3	3.1	.0024	.0182	.0050	.0000	.10	2.8	....
3434	1906 Feb. 1	None	V. slight	None	0.35	7.0	3.3	.0026	.0094	.0050	.0000	.05	2.4	....
4130	Nov. 4	None	Marked veg.	S. veg.	0.35	6.7	3.7	.0036	.0150	.0050	.0000	.05	2.6	No ..
4363	1907 Mar. 16	V. slight	S. fibrous	S. foul	0.00	3.2	....	.0010	.0024	.0050	Ft. tr.	.06	0.6	....
4453	Apr. 18	None	S. earthy	Earthy	0.20	4.5	3.0	.0012	.0106	.0100	.0020	.04	1.9	No *
4502	May 4	None	S. floc.	S. veg.	0.05	4.7	2.7	.0038	.0074	.0100	.0000	.10	1.9	....
4998	Nov. 5	V. slight	S. coarse	None	0.35	5.5	3.5	.0012	.0120	.0050	.0000	.14	2.6	....
5264	1908 Apr. 29	V. slight	S. floc.	None	0.15	3.6	2.6	.0018	.0068	.0100	.0000	.09	1.6	....
5965	1909 Feb. 3	None	None	None	0.30	6.4	3.5	.0040	.0110	.050	.0000	.04	2.7	....
5971	Feb. 4	V. slight	V. slight	Earthy	0.60	6.6	3.2	High	.0160	.020	Sl. trace	.04	2.6	....
7775	1910 Apr. 8	Mod.	Cons. floc.	Cons. earthy	0.40	6.5	4.4	.0008	.0070	.0020	.0000	.09	1.5	....

*a* Reservoir filling; *b* reservoir half full; *c* heavy thaw; *d* heavy thaw; *e* offensive; *f* heavy thaw; *g* sample from pipes; *h* filtered through sand filter; *i* filtered through sand filter, No. 1; *j* filtered through sand filter, No. 2. \* *B. Coli* present.

**Haverhill.**—No public supply. The Haverhill Aqueduct Company, a stock company, built a system of water works for the town more than fifty years ago, the source of the supply being a spring. Water flows by gravity through a lead main and service pipes. The village of Woodsville in this town has a public system. For analyses of water see Woodsville.

*Examination of Water from Faucets of Haverhill Aqueduct Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
771	1902 Sept. 3	None	None	None	0.0	6.10	3.90	.0000	.0000	.0300	.0000	.065	3.6	....
1407	1903 Aug. 5	None	None	Slight	0.0	5.00	2.80	.0000	.0000	.0000	.0000	.05	2.7	....
1960	1904 May 16	None	Con. fine	S. veg.	0.0	4.10	3.10	.0056	.0032	.0150	.0000	.08	2.7	.070 ..
1997	May 30	None	None	None	0.0	5.10	3.30	.0000	.0032	.0000	.0000	.10	2.6	....
2536	Nov. 15	None	None	V. slight	0.05	5.3	3.6	.0000	.0030	.0175	.0000	.12	3.2	....
2679	1905 Feb. 2	None	Slight	S. musty	0.05	6.2	3.8	.0000	.0000	.0200	.0000	.10	2.0	....
3407	1906 Jan. 22	None	S. coarse	S. veg.	0.03	5.0	3.2	.0020	.0044	.0100	.0000	.10	2.3	Tr. ..
4109	Oct. 28	None	Slight	None	0.05	8.3	6.0	.0012	.0030	.0100	.0000	.07	2.6	.04 ..
4499	1907 May 3	Consid.	Much earthy	None	Op.	3.3	1.7	.0022	.0028	.0300	.0000	.08	1.6	.05 ..
4990	Oct. 30	Marked	Heavy earthy	None	Op.	9.1	7.1	.0002	.0134	.0060	.0000	.07	2.6	.045 *
5261	1908 Apr. 29	None	None	None	0.05	4.5	2.9	.0004	.0018	.0020	.0000	.07	2.2	.05 ..
7667	1910 Feb. 25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.200 ..
7778	Apr. 10	None	Sl. Silt.	Sl. earthy	0.00	3.6	1.6	.0008	.0030	.020	.0000	.09	1.1	.200 ..

*Examination of Water from Supplies of Pike Manufacturing Company.*

7471	1909 Oct. 25	V. slight	Slight	Sl. earthy	0.00	.....	.....	.0012	.0120	.0400	.0000	.20	5.3	.... <i>a</i>
7542	Dec. 6	None	V. slight	None	0.00	4.5	.....	.0002	.0005	.0500	.0000	.05	1.6	.000 <i>c</i>
7546	Dec. 9	V. slight	V. slight	None	0.10	.....	.....	.0001	.0025	.005	.0000	.20	1.5	.... <i>b</i>
8040	1910 July 6	Slight	V. slight	None	0.05	.....	.....	.0015	.0010	.0025	.0000	.20	2.6	.... <i>d</i>

\* B. Coli present. *a* Reservoir; *b* stream; *c* spring; *d* well.



**Henniker.**—Water is from the private supplies of the Henniker Spring Water Company, installed in 1884, and the Dow system, installed in 1874. The sources are springs and wells. The wells, three in number, are from 15 to 18 feet deep, with four springs used as feeders to them. The force is gravity, with four miles of galvanized iron main and service pipes. One hundred and thirty families, 95 per cent. of the population, take this water.

*Examination of Water from a Faucet of the Henniker Spring Water Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
745	1902 Aug. 26	None	None	None	0.0	5.90	4.50	.0000	.0000	.0100	.0000	.07	2.6	...
3127	1905 Aug. 31	None	None	None	0.00	6.5	4.8	.0000	.0012	.0400	.0000	.15	...	...
4117	1906 Oct. 31	None	None	None	0.10	6.3	4.3	.0008	.0024	.0050	.0000	.07	1.9	...
4451	1907 Apr. 18	None	None	S. musty	0.05	5.0	3.2	.0010	.0010	.0150	.0000	.09	1.2	...
4989	Oct. 30	V. slight	V. slight	None	0.30	4.2	2.7	.0004	.0070	.0100	.0000	.08	1.2	...
5015	Nov. 14	None	Slight	None	0.05	3.0	2.2	.0006	.0026	.0040	.0000	.30	0.4	...
5016	Nov. 14	V.S. opal	V. slight	None	0.05	3.7	2.8	.0002	.0010	.0050	.0000	.16	0.4	...
5017	Nov. 13	None	None	None	0.08	5.4	3.7	.0030	.0004	.0100	.0000	.32	1.2	...
5262	1908 Apr. 28	None	None	None	0.00	5.0	2.8	.0006	.0004	.0020	.0000	.09	0.4	...
5579	1909 Aug. 28	V. slight	V. slight	None	0.05	7.0	4.5	.0004	.0014	.0020	.0000	.19	1.9	...
5576	Sept. 3	Slight	V. slight	Slight	0.00	5.7	4.2	.0004	.0038	.0070	.0000	.09	.4	...
7798	1910 Apr. 13	None	V. slight	None	0.00	2.5	2.2	.0006	.0054	.0500	.0001	.10	.7	...

\* B. Coli present. 10.5 zinc.

**Hill.**—The present system of Hill Water Works, owned by F. R. Woodward, consists of the original Sumner stream supply, supplemented by a spring with flow of forty gallons per minute. The major portion of the supply consists of the brook water, filtered through sandy soil and collected in a well, from which it is distributed through about two miles of cement-lined mains, with galvanized service pipes. Seventy families, or practically the whole village, is supplied from this system.

*Examination of Water from the Woodward Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
761	1902 Sept. 2	None	None	None	0.0	6.00	2.50	.0000	.0028	.0700	.0000	.22	1.8	....
1208	1903 May 24	None	None	None	0.0	4.40	2.70	.0008	.0076	.1000	.0001	.25	2.6	....
2727	1905 Feb. 28	None	None	None	0.10	4.4	3.0	.0000	.0000	.0150	.0000	.12	0.4	....
3035	Aug. 1	None	None	Veg.	0.60	5.0	2.0	.0000	.0060	.0400	.0000	.05	0.9	.... *
3066	Aug. 9	Slight	M. floe.	S. veg.	0.15	6.6	4.2	.0006	.0064	.0150	.0000	.07	1.2	.... *
3111	Aug. 22	None	V. slight	Earthy	0.05	3.8	1.8	.0008	.0010	.0000	.0000	.10	....	.... *
3113	Aug. 22	None	V. slight	Slight	0.10	3.5	1.2	.0008	.0022	.0100	.0000	.11	....	.... *
3223	Oct. 10	None	V. slight	S. veg.	0.20	4.7	2.7	.0020	.0060	.0100	.0000	.05	1.1	....
3370	Dec. 22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.... *
3500	1906 Mar. 5	None	S. fine	None	0.15	1.9	1.4	.0006	.0054	.0050	.0000	.15	0.9	....
3718	July 2	None	None	None	0.20	4.2	1.6	.0014	.0070	.0350	.0000	.07	0.7	.... *
3956	Sept. 10	V.S. opal	Slight	Much	0.10	4.6	2.6	.0026	.0070	.0050	.0000	.15	1.1	....
3958	Sept. 10	None	S. fine	Slight	0.00	4.5	2.6	.0024	.0040	.0050	.0000	.15	1.1	....
4258	Dec. 31	None	S. ferrug.	Veg.	0.05	3.0	2.6	.0008	.0044	.0050	.0000	.11	1.9	....
5260	1908 May 1	None	None	None	0.20	2.9	1.7	.0002	.0034	.0150	.0000	.10	.9	....
5514	Aug. 18	None	Slight	None	0.15	4.7	3.2	.0002	.0008	.0080	.0000	.12	1.2	....
5972	1909 Feb. 4	None	None	None	0.10	3.7	2.2	.0010	.0025	.0100	.0000	.10	.9	....
7845	1910 Apr. 28	V. slight	Slight	None	0.40	3.5	1.7	.0007	.0105	.0250	.0000	.15	1.2	....

\* B. Coli present.

**Hillsborough.**—The Hillsborough Bridge Village Fire Precinct owns a water supply, instituted in the autumn of 1886. The source is a pond of about 500 acres; average depth about 15 feet; bottom, sand and ledge, with natural deposit. The water flows by gravity to intermediate reservoir of 500,000 gallons' capacity. The total length of mains is eight miles, cast-iron and cement-lined iron pipe; service pipes are mostly galvanized iron. Practically the entire population of the precinct are supplied with this water. There are a few private wells within the area reached by the public supply.

*Examination of Water from Faucet of the Hillsborough Bridge Village Fire Precinct.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
746	1902 Aug. 20	None	None	None	0.2	3.70	1.30	.0000	.0060	.0120	.0000	.12	1.2	.....
1374	1903 Aug. 27	Slight	Floc. veg.	V. slight	0.2	5.10	1.10	.0000	.0080	.0000	.0000	.08	0.9	.....
1781	1904 Jan. 4	Slight	Slight	Slight	0.15	4.10	2.00	.0000	.0072	.0000	.0000	.12	1.5	.....
1967	May 17	V. slight	Slight	None	0.05	3.60	1.90	.0000	.0080	.0000	.0000	.05	1.6	.....
2685	1905 Feb. 8	None	None	Arom.	0.1	4.2	2.0	.0000	.0076	.0000	.0000	.12	0.4	.....
3156	Sept. 12	None	None	Earthy	0.15	4.5	2.3	.0006	.0116	.0100	.0000	.07	0.9	.....
3398	1906 Jan. 17	None	S. fine	S. earthy	0.30	3.7	1.3	.0010	.0050	.0050	.0000	.07	0.9	.....
4120	Dec. 1	None	None	Earthy	0.10	3.5	1.7	.0010	.0088	.0050	.0000	.07	0.9	.....
4210	Dec. 6	None	None	Veg.	0.10	3.3	1.3	.0010	.0074	.0050	.0000	.05	0.4	.....
4281	1907 Jan. 16	None	None	Sl. veg.	0.10	.....	.....	.0030	.0090	.0000	.0000	.05	2.7	.....
4454	Apr. 18	None	V. slight	Mark. earthy	0.20	3.2	1.9	.0016	.0084	.0050	.0000	.13	1.2	.....
4861	Sept. 2	V. slight	V. slight	None	0.15	2.0	1.1	.0004	.0094	.0050	.0000	.17	0.4	.....
5001	Nov. 4	V. slight	V. slight	S. earthy	0.20	2.4	0.7	.0022	.0068	.0040	.0000	.18	0.4	.....
5263	1908 Apr. 28	None	Slight	None	0.30	3.5	2.2	.0004	.0036	.0100	.0000	.08	0.4	.....
5558	Aug. 25	V. faint	V. slight	S. earthy	0.10	2.1	1.3	.0002	.0050	.0060	.0000	.13	0.4	.....
5963	1909 Feb. 2	None	None	Hay	0.10	2.6	1.2	.0025	.0090	.0000	.0000	.06	.10	.....
7783	1910 Apr. 11	None	None	Sl. Swampy	0.30	4.8	1.4	.0028	.0100	.0020	.0000	.14	.6	.....

\* B. Coli present.

**Hinsdale.**—

*Examination of Water from the Spring of Holland & Ferrin.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
7627	1910 Feb. 1	None	Sl. coarse	None	0.00	.....	.....	.0008	.0010	.6000	.0006	1.00	4.6	.....

*Examination of Water from the Spring of Canal Street Spring Company.*

8180	1910 July 22	None	V. slight	None	0.00	.....	.....	.0010	.0011	.005	.0000	.15	2.6	.000 ..
------	-----------------	------	-----------	------	------	-------	-------	-------	-------	------	-------	-----	-----	---------

**Hooksett.**—A system derived from Pinnacle Pond supplies a number of families.

*Examination of Water from Pinnacle Pond.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
866	1902 Oct. 16	None	None	S. veg.	0.0	3.40	1.20	.0000	.0042	.0000	.0000	.17	.9	.....
2569	1904 Dec. 5	V. slight	M. flocc.	S. veg.	0.0	2.4	2.0	.0000	.0050	.0050	.0000	.15	0.4	.....
3399	1906 Jan. 18	V. slight	V. slight	S. veg.	0.0	3.4	2.1	.0010	.0050	.0050	.0000	.15	0.7	.....

*Examination of Water from the Well Owned by Boston & Maine Railroad at Martin's Station.*

7276	1909 Aug. 12	None	V. slight	V. slight	0.00	.....	.....	.0040	.0010	.200	.0000	.70	3.7	.....
------	-----------------	------	-----------	-----------	------	-------	-------	-------	-------	------	-------	-----	-----	-------

<sup>1</sup>.80 zinc.

**Hopkinton.**—The water works of the Hopkinton Village Aqueduct Association, incorporated, were built about 1841. The water is from wells dug from eight to fifteen feet through sandy loam, sandy gravel, and hardpan and flows continually, by gravity, to the consumers. There is about three fourths of a mile of cement-lined iron pipe main, with lead service pipes. Forty-three families, about 70 per cent. of the fire district, have this water.

Besides the above families, who have constantly running water, this company supplies a public drinking fountain, the hotel, schools, town and lyceum halls, and public library.

*Examination of Water from Supply of Hopkinton Village Aqueduct Association.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
876	1902 Oct. 16	None	None	None	0.0	8.90	4.20	.0000	.0000	.0300	.0000	.15	1.6	....
2146	1904 July 10	None	None	None	0.0	3.60	1.40	.0014	.0008	.0500	.0000	.15	1.4	....
3147	1905 Sept. 6	None	S. flocc.	V. slight	0.15	8.0	4.2	.0008	.0020	.0250	.0000	.25	1.9	....
8318	1910 Aug. 15	None	None	None	0.00	.....	.....	.0010	.0020	.025	.0000	.15	1.9	.000 ..

The village of Contoocook is supplied with a water of good quality from Bear Pond.

*Examination of Water from Contoocook Village Supply.*

4183	1906 Nov. 22	None	None	S. earthy	0.10	3.0	1.5	.0014	.0054	.0100	.0000	.07	0.4	....
4445	1907 Apr. 17	None	V. slight	Veg.	0.10	2.7	1.9	.0010	.0030	.0100	.0000	.13	1.2	....
4987	Oct. 28	None	None	None	0.00	2.3	1.5	.0002	.0074	.0040	.0000	.19	0.4	....
5283	1908 May 6	None	None	S. swampy	0.10	3.4	1.1	.0002	.0028	.0100	.0000	.14	0.4	....
7790	1910 Apr. 12	None	V. slight	None	0.00	1.7	.9	.0014	.0090	.0020	.0000	.14	.4	....



**Hudson.**—No public supply. The Hudson water works, owned by a private company, were built in 1892. The source of the supply is a well 20 feet deep and 22 feet wide, dug through loam and gravel. The water is pumped to a standpipe 12 feet in diameter and 60 feet high.

*Examination of Water from Well Supplying Town of Hudson.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites			
69	1901 July 16	None	S. flocc.	None	0.0	6.00	3.70	.0014	.0026	.0000	.0000	.40	.....	..
2744	1905 Mar. 7	None	Slight	None	0.0	5.6	4.4	.000	.0000	.0300	.0000	.37	2.0	.....
2991	July 18	None	S. flocc.	None	0.3	6.0	3.8	.0014	.0060	.0100	.0000	.30	1.6	.....
3416	1906 Jan. 26	None	None	S. veg.	0.0	6.2	4.2	.0010	.0028	.0300	.0000	.30	1.9	.....
4185	Nov. 22	None	Slight	Slight	0.05	5.0	4.3	.0006	.0044	.0350	.0000	.35	1.9	.....
5970	1909 Feb. 4	None	V. slight	None	0.00	5.8	4.0	.0002	.0001	.030	.0000	.36	1.6	.....
7565	Dec. 20	None	None	None	0.05	5.2	2.3	.0010	.0012	.030	.0000	.45	3.60	..... <sup>1</sup>
7622	1910 Jan. 28	Slight	Slight	Swampy	0.70	5.7	2.6	.0025	.0110	.005	.0000	.40	2.2	.....
8271	Aug. 4	None	None	None	0.00	7.3	2.9	.0010	.0015	.010	.0000	.35	2.6	..... <sup>1</sup>

<sup>1</sup> No zinc present.

**Jackson.**—C. W. Gray & Co. installed a private water supply in 1904. The source is a stream of about 1,000 acres watershed, all wooded, no inhabitants. The water is of excellent quality, taken from a mountain stream about two miles from the village. There is a pressure of about eighty pounds per square inch. About three miles of iron service and wrought iron service pipe is employed in this system. Fifteen families, 50 per cent. of the population, are supplied.

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
7911	1910 May 23	None	None	Sl. Arom.	0.20	1.5	.5	.0010	.0035	.0025	.0000	.05	.4	....

**Jaffrey.**—The town instituted a system of water works in 1902, the source being a pond in Rindge having an area of 40 acres, an average depth of 20 feet, with hardpan bottom. The water flows by gravity through nine miles of 12-inch, cast-iron distributing mains; service pipes, six-inch cast iron.

*Examination of Water from Bullet Pond, Rindge.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
186	1901 Oct. 1	None	S. veg.	Dec. veg.	0.12	2.80	1.30	.0016	.0166	.0000	.0000	.16	...	...
232	Oct. 20	None	None	Veg.	0.12	.....	.....	.0016	.0180	.0000	.0000	.09	...	...
340	1902 Jan. 5	None	None	Veg.	0.2	2.30	1.10	.0032	.0172	.0000	.0000	.08	0.4	...
348	Jan. 5	None	None	Veg.	0.2	2.50	1.10	.0032	.0162	.0000	.0000	.09	0.4	...
4373	1903 July 27	Slight	None	S. mus-ty	0.1	5.10	1.90	.0016	.0058	.0000	.0000	.08	1.4	...
1686	Nov. 23	Slight	V. S. fine	V. dec. veg.	0.1	4.00	1.10	.0000	.0144	.0300	.0000	.15	1.2	...
1687	Nov. 23	Slight	V. S. fine	Dec. veg.	0.2	4.20	2.10	.0014	.0128	.0200	.0000	.15	1.1	...
1758	Dec. 22	Slight	V. slight	V. mark. veg.	0.1	4.20	2.40	.0006	.0062	.0000	.0000	.25	2.3	...
1759	Dec. 22	Slight	Slight	V. mark. veg.	0.1	3.90	2.10	.0000	.0074	.0000	.0000	.20	2.3	...
1955	1904 May 16	Consid.	M. fine	V. arom.	0.2	4.20	2.20	.0000	.0110	.0000	.0000	.18	2.0	...
2687	1905 Feb. 9	None	None	Slight	0.1	4.3	2.1	.0030	.0120	.0000	.0000	.17	0.7	...
3138	Sept. 5	None	None	Slight	0.1	3.7	2.1	.0010	.0136	.0100	.0000	.17	0.9	...
3463	1906 Jan. 22	None	None	Veg.	0.1	3.5	1.5	.0026	.0074	.0100	.0000	.22	0.7	...
3978	Sept. 17	None	V. slight	S. veg.	0.15	4.0	1.5	.0010	.0074	.0050	.0000	.17	0.7	...
3981	Sept. 17	None	V. slight	None	0.10	4.1	1.6	.0030	.0094	.0050	.0000	.15	1.1	...
4138	Nov. 7	None	None	Slight	0.05	4.1	2.6	.0014	.0074	.0050	.0000	.10	1.0	...
4452	1907 Apr. 18	None	None	S. foul	0.10	.....	.....	.0014	.0052	.0050	.0000	.22	0.4	...
5000	Nov. 4	None	None	None	0.05	2.4	1.0	.0012	.0058	.0060	.0000	.19	0.4	...
5282	1908 May 5	None	None	None	0.15	2.6	1.0	.0004	.0036	.0040	.0000	.12	0.3	...
5969	1909 Feb. 3	None	None	Sl. earthy	0.00	3.1	1.7	.0050	.0060	.0000	.0000	.10	.3	...
7145	June 29	None	V. slight	Musty	0.05	2.5	1.2	.0005	.0060	.0000	.0000	.13	.3	... *a
7166	July 6	None	Sl. veg.	Woody	0.10	3.0	1.3	.0020	.0080	.0000	.0000	.10	.3	...
7841	1910 Apr. 27	V. slight	V. slight	Slight	0.10	2.4	1.0	.0030	.0125	.0030	.0000	.15	.4	...

\* B. Coli present; a River water pumped into system.

*Examination of Water from Well of Annett Brothers.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
8258	1910 Aug. 2	None	None	None	0.05	.....	.....	.0012	.0026	.0050	.0000	.20	1.2	.....

*Examination of Water from Well of J. P. Pierre.*

7904	May 19	Sl. opal	None	None	0.10	.....	.....	.0030	Very High	.075	.0010	3.9	6.0	.....	*
------	--------	----------	------	------	------	-------	-------	-------	-----------	------	-------	-----	-----	-------	---

\* B. Coli present.

**Keene.**—In 1870 the City of Keene installed a public water supply from two ponds, one 50 acres and the other 110 acres in area—Sylvan Lake having an average depth of 20 feet, and Echo Lake 12 feet. There are also several auxiliary supplies.

About forty miles of cast-iron and cement-lined distributing mains and galvanized iron service pipes constitute this system. Twenty-two hundred persons, 85 per cent. of the population, take from this service. There are no private wells in the area.

*Examination of Water from Keene Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
27	1901 June 24	V. slight	S. floe.	Dec. veg.	0.2	2.80	1.00	.0000	.0169	.0000	.0000	.18	....	.... a
455	1902 Mar. 27	Slight	Slight	Veg.	0.23	1.60	.70	.0010	.0122	.0150	.0000	.07	0.7	.... b
456	Mar. 27	Slight	Slight	Veg.	0.23	2.00	1.00	.0020	.0076	.0000	.0000	.07	0.7	.... c
457	Mar. 27	V. slight	Slight	Veg.	0.32	3.10	.80	.0000	.0052	.0000	.0000	.07	0.6	.... d
458	Mar. 27	Marked	Slight	Veg.	0.12	2.10	.80	.0010	.0078	.0000	.0000	.11	0.6	.... e
1172	1903 May 3	Slight	Floc. fine	Veg.	0.2	2.80	1.50	.0014	.0198	.0000	.0000	.15	0.9	.... f
1173	May 4	Slight	Fine floc.	Veg.	0.15	5.00	2.00	.0014	.0158	.0000	.0000	.15	0.9	....
1174	May 4	Slight	Fine floc.	Veg.	0.1	3.00	0.60	.0020	.0202	.0000	.0000	.17	0.6	.... g
1175	May 4	Slight	Much fine floc.	Veg.	0.15	4.90	1.60	.0000	.0060	.0000	.0000	.10	0.4	....
2725	1905 Feb. 27	None	V. slight	Veg.	0.1	4.5	2.6	.0000	.0000	.0100	.0000	.15	0.1	....
3150	Sept. 5	None	V. slight	Veg.	0.2	4.8	3.5	.0020	.0116	.0200	.0000	.20	0.4	.... h
3406	1906 Jan. 22	None	V. slight	Veg.	0.2	3.6	1.8	.0050	.0064	.0100	.0000	.07	0.7	.... i
4145	Nov. 9	None	V. slight	None	0.10	3.7	1.5	.0034	.0134	.0050	.0000	.12	0.4	.... *
4186	Nov. 23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4571	1907 May 27	None	S. floe.	Earthy	0.30	2.8	1.4	.0014	.0036	.0130	.0000	.13	0.1	.... *
4600	.....	None	S. floe.	Earthy	0.30	2.8	1.4	.0014	.0036	.0130	.0000	.13	0.1	.... *
4710	July 18	None	V. slight	S. earthy	0.05	4.1	1.7	.0014	.0004	.0050	.0000	.29	0.6	.... *
5308	1908 May 21	None	V. slight	Slight	0.20	2.6	.9	.0014	.0124	.0080	.0000	.08	0.4	....
5594	Sept. 1	V. slight	Sl.ferrug.	None	0.08	4.4	1.4	.0020	.0044	.0100	.0000	.19	.3	....
5714	Oct. 1	V. slight	Slight	Mar-shy	0.10	.....	.....	.0005	.0010	.0100	.0000	.05	.0	....
5750	Oct. 13	None	V. slight	Slight	0.15	3.7	2.3	.0050	.0100	.0000	.0000	.10	.2	....
5782	Oct. 22	V. slight	None	Mark. earthy	0.10	1.0	.3	.0040	.0115	.0000	.0000	.09	.2	....
5817	Nov. 2	None	V. slight	Earthy	0.20	2.7	.7	.0008	.0050	.0000	.0000	.10	.3	....
7789	1910 Apr. 12	None	V. slight	Earthy	0.15	2.0	1.3	.0020	.0089	.0020	.0000	.15	.4	....

a Sample from Goose Pond; b sample from stream proposed as an additional supply; c sample from small stream flowing through an alder swamp; d small stream, part of proposed supply; e sample from Woodward Pond; f sample from intercepting reservoir; g sample from Sylvan Lake; h sample from Echo Lake; i sample from Roaring Brook. \* B. Coli present.



**Kensington.**—*Examination of Water from Well of Congregational Parsonage.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
8100	1910 July 11	V. slight	V. slight	Mark. earthy	0.10	.....	.....	Very High	.0080	Too High to Read	High	6.20	7.9	.012 *

\* B. Coli present.

**Laconia.**—The Laconia Water Company was incorporated in 1885. The supply is from Lake Paugus (Long Bay), a branch of Lake Winnepesaukee. This bay receives the sewage from The Weirs and from numerous cottages along its shores. The reservoir, 135 x 90 feet, and 18 feet deep, has a capacity of 2,700,000 gallons. There is about 28 miles of cement and cast-iron mains, while the service pipes are wrought iron, cement-lined. About 90 per cent. of the population are supplied from this source; very few wells. (See correspondence elsewhere in this report.)

*Examination of Water Supply of Laconia and Lakeport.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
532	1902 May 19	None	V. slight	S. veg.	0.1	2.80	.90	.0000	.0014	.0000	.0000	.13	.6	....
822	Sept. 22	None	None	V. slight	0.1	4.00	1.10	.0000	.0062	.0000	.0000	.11	.6	....
2141	1904 July 11	None	None	None	0.4	7.70	4.90	.0022	.0098	.0450	.0008	.20	2.2	....
2732	1905 Mar. 1	None	V. slight	None	0.00	3.3	1.3	.0014	.0020	.0000	.0000	.15	0.6	.... *
3145	Sept. 6	V. slight	V. slight	Veg.	0.10	3.2	1.5	.0010	.0080	.0250	.0000	.12	0.9	....
3408	1906 Jan. 22	None	None	None	0.07	2.0	1.5	.0010	.0048	.0100	.0000	.17	0.7	....
3738	July 10	None	None	S. earthy	0.10	3.1	1.0	.0020	.0084	.0250	.0000	.05	1.0	....
4128	Nov. 5	None	None	Veg.	0.10	4.0	2.3	.0014	.0102	.0050	.0000	.05	....	....
4460	1907 Apr. 24	None	V. slight	Sl. foul	0.05	2.4	1.9	.0010	.0026	.0130	.0000	.17	1.4	....
4735	July 19	None	None	S. earthy	0.00	2.7	1.8	.0006	.0044	.0050	.0000	.18	1.9	....
4736	July 19	None	None	None	0.00	....	....	.0010	.0036	.0050	.0000	.18	1.2	....
4832	Aug. 28	.....	.....	.....	0.10	2.5	1.5	.0002	.0058	.0050	.0000	.16	1.2	....
5003	Nov. 1	None	None	None	0.05	2.1	1.0	.0004	.0036	.0040	.0000	.19	0.7	....
5287	1908 May 8	V. slight	V. slight	None	0.12	2.9	.9	.0006	.0034	.0020	.0000	.18	0.7	....
5927	1909 Jan. 7	None	None	Sl. earthy	0.05	3.5	1.8	.0002	.0045	.0000	.0000	.08	.6	....
5928	Jan. 7	None	V. slight	Sl. foul	0.05	2.7	1.3	.0010	.0045	.0000	.0000	.08	.4	....
5929	Jan. 7	V. slight	V. slight	Sl. earthy	0.05	2.8	1.5	.0002	.0055	.0000	.0000	.09	.4	....
5930	Jan. 7	V. slight	V. slight	None	0.05	2.6	1.3	.0002	.0050	.0000	.0000	.07	.3	....
5935	Jan. 14	Mod.	Slight	Sl. earthy	0.05	2.6	1.2	.0035	.0100	.0000	.0000	.10	.3	....
5947	Jan. 25	V. slight	Slight	Oily	0.05	3.2	1.0	.0025	.0060	.0000	.0000	.15	.4	.... *a
5948	Jan. 25	V. slight	V. slight	Sl. oily	0.05	2.4	1.3	.0020	.0060	.0000	.0000	.12	.7	.... b
5949	Jan. 25	V. slight	Slight	Sl. oily	0.05	2.5	.8	.0020	.0050	.0000	.0000	.11	.3	.... c
5950	Jan. 25	Slight	Slight	Sl. swampy	0.20	4.4	2.2	.0040	.0090	.0000	.0000	.17	.4	.... d
7786	1910 Apr. 12	None	None	Dist. veg.	0.05	2.2	.6	.0014	.0089	.0010	.0000	.15	.3	....

\* B. Coli present; a Near Independent Ice Houses; b near intake; c Weirs Channel; d mouth of Block Brook, near R. R.

*Examination of Water from Opeechee Lake, Water Supply for the State  
School for the Feeble-Minded.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
1221	1903 June 10	None	Sl. fine	V. slight	0.05	3.90	0.60	.0000	.0080	.0000	.0000	.15	1.5	....
1222	June 10	None	Sl. fine	V. slight	0.05	6.20	1.60	.0000	.0074	.0000	.0000	.15	1.5	....
2000	1904 May 31	Slight	Sl. fine	S. foul	0.05	3.40	1.40	.0000	.0084	.0050	.0000	.15	1.1	....
3173	1905 Sept. 17	V. slight	None	None	0.0	3.7	1.5	.0028	.0130	.0050	.0000	.15	0.7	....
3474	1906 Feb. 21	None	V. slight	None	0.0	2.7	1.5	.0030	.0080	.0050	.0000	.20	1.2	....
4173	Nov. 20	None	V. slight	None	0.10	4.0	3.0	.0034	.0104	.0050	.0000	.17	1.2	.... *
6055	.....	Slight	S. earthy	None	0.10	3.1	1.6	.0040	.0140	.015	.0000	.07	.4	....

*Examination of Water from Well Owned by School for the Feeble-Minded.*

6056	.....	Cons. flocc.	Slight	Mark. foul	0.05	.....	.....	High	High	.250	.0014	2.6	5.3	.... *
------	-------	--------------	--------	------------	------	-------	-------	------	------	------	-------	-----	-----	--------

\* B. Coli present.

**Lancaster.**—The Lancaster Water Company's works were installed in 1891, and transferred to the precinct in 1894. The source of the supply is a mountain stream at a sufficient elevation to furnish pressure by gravity, and its reservoir has a capacity of 2,000,000 gallons. The distribution is through some 12 miles of iron mains, 12-inch to 6-inch. The service pipes also are of iron. Four hundred and sixty families, 98 per cent. of the population, are supplied.

*Examination of Water Supply of Lancaster.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
813	1902 Sept. 19	None	None	V. slight	0.1	3.40	1.50	.0000	.0012	.0200	.0000	.05	1.5	.....
1408	1903 Aug. 4	None	None	None	0.1	4.80	1.60	.0000	.0034	.1100	.0000	.10	1.6	.....
1965	1904 May 17	Slight	Con. fine	S. veg.	0.25	3.60	1.90	.0000	.0150	.0450	.0000	.05	1.4	.....
2686	1905 Feb. 8	None	None	None	0.05	5.0	2.2	.0000	.0000	.0300	.0000	.05	1.2	.....
3187	1905 Sept. 20	None	None	Slight	0.20	4.7	1.7	.0020	.0074	.0100	.0000	.05	1.1	.....
3409	1906 Jan. 23	None	None	None	0.10	3.5	2.5	.0010	.0034	.0200	.0000	.04	0.7	.....
4486	1907 Apr. 30	V.S. opal	V. slight	None	0.20	3.2	2.0	.0004	.0060	.0100	.0000	.07	1.2	.....
4985	1907 Oct. 28	None	V. slight	None	0.20	3.3	2.5	.0016	.0030	.0200	.0000	.10	1.2	.....
7810	1910 Apr. 14	None	None	Sl. swampy	0.30	5.3	3.5	.0032	.0025	.0040	.0001	.07	.6	.....

**Lebanon.**—The water supply is owned by the Fire Precinct, and was installed in 1897. At first the water was taken directly from a stream flowing from Mascoma Lake, later on from wells, 63 x 30 x 15 feet, supplied by 900 feet loose-jointed pipe, fed by water infiltrated from the river.

During 1907 a mechanical filter plant was installed and the river water, after a preliminary sedimentation and treatment with coagulant, is passed through these filters before pumping to the reservoir. Analyses made thus far indicate that the filtration process is very successful.

A spring, known as the Kendrick & Davis supply, is also used to some extent.

The village of West Lebanon is furnished with water supplied by the Hartford Water Company, White River Junction, Vt.

*Examination of Water from the Lebanon Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
33	1901 June 27	None	S. floe.	S. veg.	0.3	4.60	2.80	.0000	.0115	.0000	.0000	.22	.....	.....
34	June 27	None	Min. matter	V. slight	0.0	7.60	5.30	.0000	.0000	.0100	.0000	.31	.....	.....
53	July 6	Marked	Much. min.	None	0.0	6.70	4.10	.0073	.0098	.0000	.0000	.33	.....	.....
54	July 6	None	Min.	None	0.0	6.00	3.40	.0028	.0100	.0900	.....	3.51	.....	.....
614	1902 June 25	Slight	V. slight	Arom. veg.	0.27	.00	2.60	.0006	.0082	.0330	.0000	.12	1.8	.....
1144	1903 Apr. 19	None	None	Dec. veg.	0.0	5.00	3.60	.0000	.0190	.0000	.0000	.12	1.6	..... a
1297	July 6	Slight	Floc.	None	0.15	5.10	2.70	.0000	.0072	.0000	.0000	.10	2.0	.....
1298	July 6	Slight	Floc.veg.	S. veg.	0.32	5.30	1.70	.0000	.0080	.0000	.0000	.06	1.5	..... a
1968	1904 May 18	None	None	V. slight	0.1	4.60	2.80	.0000	.0044	.0000	.0000	.10	2.3	.....
2251	Aug. 8	Slight	Much floe. red	S. veg.	0.5	5.80	2.70	.0014	.0024	.0000	.0000	.30	2.4	..... *
2293	Aug. 22	None	V. slight	V. slight	0.05	2.00	4.00	.0000	.0020	.0000	.0000	.10	1.8	..... *
2294	Aug. 22	None	None	V. slight	0.05	3.90	1.90	.0000	.0070	.0000	.0000	.10	1.6	..... *
2391	Oct. 3	None	None	None	0.15	4.0	1.7	.0000	.0022	.0000	.0000	.12	2.3	..... *
2397	Oct. 3	None	None	S. earthy	0.00	5.0	1.8	.0096	.0020	.0000	.0001	.10	2.0	..... *a
2665	1905 Jan. 29	V. slight	S. fine	S. mus-ty	0.00	19.5	15.6	.0014	.0000	.0000	.0001	2.0	7.4	..... b
2684	Feb. 6	Slight	M. fine	Pecu- liar	0.05	17.6	15.6	.0020	.0000	.0000	.0004	2.0	7.0	..... b
2949	July 3	None	S. floe.	S. earthy	0.17	5.4	2.9	.0000	.0014	.0000	.0000	.15	1.6	..... *
3140	Sept. 5	None	None	None	0.10	6.7	4.8	.0006	.0060	.0200	.0000	.27	2.7	.....
3298	Nov. 16	None	None	S. earthy	0.20	5.2	3.0	.0010	.0058	.0100	.0000	.25	2.4	.....
3426	1906 Jan. 31	None	None	None	0.10	5.9	3.4	.0006	.0024	.0050	.0000	.22	2.2	.....
3792	July 29	None	None	None	0.00	6.3	4.8	.0014	.0044	.0050	.0000	.25	2.2	.....
3870	Aug. 20	None	None	S. veg.	0.10	7.1	6.1	.0010	.0024	.0000	.0000	.27	3.5	..... *
3948	Sept. 7	None	S. floe.	None	0.15	5.2	2.8	.0036	.0050	.0030	.0000	.05	1.4	..... *
3951	Sept. 7	S. opal	Slight	Earthy	0.40	5.4	2.4	.0036	.0100	.0030	.0000	.05	1.4	..... *
4333	1907 Feb. 6	Slight	S. floe.	None	0.20	.....	.....	.0014	.0076	Trace	.0000	.17	1.9	..... a
4483	Apr. 29	None	V. slight	None	0.30	4.8	3.7	.0008	.0040	.0100	.0000	.21	2.6	.....
4599	July 11	None	S. fine	None	0.05	5.1	3.3	.0010	.0054	.0500	.0000	.15	2.6	.....
4986	Oct. 28	V. slight	V. slight	Mark. earthy	0.30	5.0	3.0	.0012	.0094	.0060	.0000	.23	1.9	..... a



*Examination of Water from the Lebanon Supply.—Concluded.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
5061	1907 Dec. 4	None	None	Slight	0.05	3.8	3.2	.0006	.0060	.0050	.0000	.13	2.6	.... a
5231	1908 Apr. 13	None	None	None	0.00	3.2	1.4	.0006	.0028	.0040	.0000	.09	1.2	.... a
5232	Apr. 13	None	V. slight	V. slight	0.30	3.6	2.2	.0042	.0068	.0100	.0000	.09	1.0	.... *a
5276	May 6	None	V. slight	Sl. arom.	0.05	5.3	4.2	.0006	.0038	.0080	.0000	.15	1.6	.... ..
5462	July 23	None	None	Slight	0.05	3.3	2.8	.0004	.0008	.0020	.0000	.10	1.2	.... ..
5757	Oct. 14	None	None	None	0.05	3.5	....	.0032	.0045	.010	.0000	.04	3.2	.... ..
5964	1909 Feb. 2	None	None	V. slight	0.10	4.7	2.5	.0020	.0040	.008	.0000	.11	1.6	.... ..
6040	Mar. 18	S. opal	None	None	0.30	....	....	.0008	.0025	.005	.0000	.14	1.8	.... *
7144	June 28	None	None	None	0.00	4.9	2.5	.0015	.0050	.0000	.0000	.15	1.5	.... ..
7797	1910 Apr. 13	V. slight	V. slight	Earthy	0.20	4.3	2.7	.0030	.0090	.0020	.0000	.08	4.4	.... ..
7931	June 1	V. slight	None	Earthy	0.10	4.4	2.9	.0010	.0060	.0025	.0000	.10	4.9	.... ..
7932	June 1	V. ft. opal	S. earthy	None	0.10	4.9	2.9	.0010	.0040	.0050	.0000	.12	2.9	.... ..

\* B. Coli present; a from Mascoma river; b artesian well.

*Examination of Water from the Kendrick & Davis Supply.*

4053	1906 Oct. 9	Consid.	Consid.	S. earthy	.03	....	....	.0006	.0044	.0100	.0000	.10	2.6	.... ..
4068	Oct. 17	None	None	None	.05	7.8	6.2	.0010	.0028	.0200	.0000	.15	2.9	.... ..
4126	Nov. 2	None	V. slight	None	.05	5.0	3.5	.0006	.0048	.0080	.0000	.07	2.3	.... ..
4127	Nov. 2	None	V. slight	None	.05	7.9	5.4	.0006	.0054	.0080	.0000	.07	3.9	.... ..

*Examination of Water Supplied West Lebanon by Hartford Water Company, White River Junction, Vt.*

3804	1906 July 31	None	None	S. veg.	0.1	7.0	4.0	.0018	.0080	.0500	.0000	.15	....	....
5493	1908 Aug. 11	M. opal	V. slight	Veg.	0.15	5.8	3.8	.0010	.0030	.0050	.0000	.07	2.6	.... ..
5498	Aug. 11	M. opal	V. slight	Veg.	0.17	5.5	3.2	.0010	.0050	.0070	.0000	.06	1.2	.... ..
5887	Dec. 14	None	Sl. floe.	Sl. fishy	0.00	8.5	6.2	.0040	.0020	.2000	Trace	.25	3.2	.... a
5961	1909 Feb. 2	None	None	None	0.00	5.7	4.2	.0015	.0005	.1200	.0000	.12	2.3	.... ..

a Sikes Springs.

*Examination of Water from Mascoma River.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
6033	1909 Mar. 18	None	None	None	0.00	.....	.....	.0030	.0035	.0050	.0000	.11	1.1	....	b
7747	1910 Mar. 24	Sl. fibre	Slight	Slight	0.30	5.4	2.8	.0006	.0120	.0500	.0000	.41	2.2	....	c

*Examination of Water from White River, Proposed Temporary Public Supply.*

5903	1908 Dec. 26	None	V.Sl. floe.	None	0.05	9.6	7.1	.0026	.0092	.0200	.0000	.20	5.3	....	*
------	-----------------	------	-------------	------	------	-----	-----	-------	-------	-------	-------	-----	-----	------	---

b Tap at Everett Knitting Mill after passing small mechanical filter; c Taken directly from river below mills; \* B. Coli present.

*Examination of Water from Spring of George R. Byrle.*

7608	1910 Jan. 20	None	None	Foul	0.05	11.5	8.5	.0025	.0025	.3000	Trace	.40	6.0	....	..
------	-----------------	------	------	------	------	------	-----	-------	-------	-------	-------	-----	-----	------	----

*Examination of Water from Spring of D. N. Sargent.*

7609	1910 Jan. 20	None	None	None	0.00	.....	9.5	.0008	.0002	.0600	.0000	.40	6.	....	..
------	-----------------	------	------	------	------	-------	-----	-------	-------	-------	-------	-----	----	------	----

*Examination of Water from Well of John Keating, West Lebanon.*

7614	1910 Jan. 24	V. slight	V. slight	Sl. earthy	0.00	.....	.....	.0010	.0010	.1500	.0000	.30	6.0	....	..
------	-----------------	-----------	-----------	------------	------	-------	-------	-------	-------	-------	-------	-----	-----	------	----

*Examination of Water from Mc Neilis' Spring, West Lebanon.*

7596	1910 Jan. 11	None	V. slight	None	0.00	14.0	9.50	.0010	.0008	.4000	.0000	.90	7.4	....	..
------	-----------------	------	-----------	------	------	------	------	-------	-------	-------	-------	-----	-----	------	----

**Lincoln.**—The J. E. Henry & Sons Co. introduced a water supply in 1903 directly from a stream. The watershed has an area of several hundred acres, wooded land. It is a gravity system, employing about one half a mile of plain iron main, and also iron service pipes. The entire village is served from this supply. There are no private wells within the area.

*Examination of Water from Faucet of Supply of J. H. Henry & Sons.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
762	1902 Sept. 1	None	V. slight	V.S. vg.	0.1	4.80	1.90	.0000	.0044	.0150	.0000	.05	.3	....
1377	1903 July 25	None	None	V. slight	0.05	4.10	1.30	.0000	.0030	.0000	.0000	.04	0.6	....
1956	1904 May 14	None	Slight	None	0.2	2.90	1.30	.0000	.0054	.0000	.0000	.05	0.9	....
3171	1905 Sept. 14	None	None	None	0.15	3.5	2.0	.0010	.0080	.0100	.0000	.10	0.6	....
3426	1906 Jan. 30	None	None	None	0.10	2.5	1.4	.0010	.0034	.0050	.0000	.05	0.4	....
4147	1906 Nov. 12	None	None	None	0.05	3.6	1.7	.0006	.0036	.0050	.0000	.07	0.4	....
4467	1907 Apr. 25	None	None	None	0.20	2.5	1.3	.0012	.0026	.0110	.0000	.07	0.9	....
4488	1907 Oct. 28	V. slight	None	None	0.50	3.0	1.7	.0002	.0070	.0050	.0000	.30	0.4	....
5338	1908 June 2	V. slight	V. slight	None	0.12	.....	.....	.0006	.0014	.0030	.0000	.06	0.4	....
7794	1910 Apr. 13	None	V. slight	Earthy	0.05	2.2	1.2	.0018	.0050	.0030	.0000	.05	.4	....

**Lisbon.**—The Lisbon Water Works, owned by a private company and installed in 1887, is supplied from a pond fed by springs. The area of the pond is 100 acres; the bottom is gravelly. This is a gravity system, the reservoir having a capacity of 1,000,000 gallons. The mains are of wrought iron, six miles, and the service pipes are the same. About three hundred families, 90 per cent. of the population, are takers; very few private wells.

*Examination of Water from the Reservoir of the Lisbon Water Works Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
796	1902 Sept. 9	Slight	Consid. flocc.	V. slight	0.0	6.90	2.60	.0000	.0066	.0000	.0000	.08	2.3	....
1387	1903 Sept. 29	Slight	None	Dec. veg.	0.1	6.70	2.80	.0000	.0120	.0000	.0000	.05	2.7	....
1985	1904 May 24	Slight	S. fine	S. musty	0.25	6.10	2.70	.0000	.0090	.0000	.0000	.05	1.9	....
2707	1905 Feb. 20	None	Slight	S. veg.	0.10	6.2	4.2	.0000	.0060	.0800	.0000	.15	2.2	....
3165	Sept. 14	None	S. fine	Earthy	0.30	5.7	2.6	.0000	.0116	.0100	.0000	.07	2.2	.... *
3442	1906 Feb. 4	None	S. ferrug.	None	0.20	5.2	3.5	.0014	.0058	.0100	.0000	.10	2.1	....
4142	Nov. 9	None	None	Slight	0.20	6.0	3.5	.0010	.0104	.0200	.0000	.05	2.2	....
4256	1907 Jan. 1	None	Slight	Veg.	0.10	4.5	....	.0030	.0100	.0050	Ft. tr.	.05	3.5	.... *
4268	Jan. 9	....	....	....	....	....	....	....	....	....	....	....	....	.... *
4290	Jan. 21	Slight	Marked flocc.	Veg.	0.20	....	....	.0044	.0102	.0050	.0000	.05	2.2	.... *
4295	Jan. 27	None	V. slight	Slight	0.10	....	....	.0044	.0052	.0050	.0000	.07	2.4	.... *
4480	Apr. 29	Sl. opal	Slight	None	0.30	4.6	2.5	.0016	.0016	.0500	.0000	.12	1.6	....
4996	Nov. 6	V. slight	V. sight	None	0.35	....	....	.0040	.0060	.0080	.0000	.16	2.6	....
5154	1908 Mar. 2	None	None	Earthy	0.20	3.5	2.5	.0010	.0036	.0060	.0000	.10	1.9	....
5185	Mar. 24	Mod'ate slight	Consid. earthy	Mark. earthy	0.20	4.0	2.5	.0026	.0084	.0040	.0000	.12	1.9	....
5316	May 22	Mod'ate	Consid. earthy	Mark. earthy	0.20	6.2	4.5	.0012	.0074	.0030	.0000	.08	2.5	....
5901	Dec. 23	None	None	None	0.00	....	....	.0015	.0030	.0100	.0000	.10	2.4	....
7795	1910 Apr. 13	V. slight	Slight	Mark. veg.	0.15	4.6	2.0	.0014	.0130	.0050	.0000	.09	1.2	....

\* B. Coli present.

**Littleton.**—The town of Littleton derives its supply from the north branch of Gale River, the intake of which is at the base of Mt. Garfield. The main pipe, 19 miles long, is 16 inches in diameter for a short distance from the intake; 12 inches for the next five miles; and 10 inches for the remainder of the distance. There are two reservoirs, of 1,000,000 and 500,000 gallons' capacity.

*Examination of Water from the Littleton Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
4469	1907. Apr. 26	None	Slight	None	0.30	5.3	1.6	.0008	.0036	.0100	.0000	.12	0.9	.....
4911	Oct. 2	Sl. opal	V. slight	Slight	0.30	2.4	1.7	.0020	.0042	.0050	.0000	.05	0.4	.....
5415	1908 July 9	None	S. fine	None	0.10	2.2	1.3	.0006	.0022	.0060	.0000	.06	0.3	.....
7536	1909 Dec. 2	None	None	None	0.00	3.0	1.6	.0008	.0020	.0100	.0000	.08	.4	.....
7800	1910 Apr. 12	None	V. slight	Sl. earthy	0.10	2.1	1.2	.0012	.0039	.0020	.0000	.07	.1	.....

**Livermore.**—The Livermore Mills Company inaugurated a water supply some twenty years ago, the source being springs, pond and streams. The watershed is about thirty thousand acres in area, and there are 150 persons living thereon. The soil is clay and gravel. The system is a combination gravity and pump, the latter 150 H. P. Iron pipe is used for the mains.

*Examination of Water from the Livermore Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
5036	1907 Dec. 29	None	Slight	None	0.00	.....	.....	.0040	.0054	.0040	.0000	.36	1.9	.... ..
5373	1908 June 26	None	V. slight	None	0.10	3.1	2.0	.0008	.0024	.0080	.0000	.07	.4	.... ..



**Lyme.**—In 1838 the Lyme Aqueduct Company inaugurated a system of water works, the source being springs.

*Examination of Water from Supply of Lyme Aqueduct Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
772	1902 Sept. 3	None	V. slight	None	0.0	8.40	4.70	.0000	.0018	.0250	.0000	.08	4.7	....	..
1723	1903 Dec. 10	Slight	S. fine	None	0.0	5.40	3.60	.0000	.0022	.0150	.0000	.07	3.1	.028	..
1975	1904 May 23	None	V. slight	S. foul	0.0	5.50	4.60	.0020	.0020	.0000	.0000	.12	4.5	....	..
3160	1905 Sept. 12	None	None	S. foul	0.1	7.5	5.3	.0014	.0024	.0100	.0000	.07	4.1	.025	..
3431	1906 Feb. 1	None	V. slight	None	0.0	7.8	5.7	.0020	.0040	.0100	.0000	.15	3.9	....	..
4150	Nov. 13	None	None	None	0.00	7.2	6.2	.0008	.0044	.0050	.0000	.10	4.6	....	..
4586	1907 May 30	None	V. slight	None	0.00	6.8	5.3	.0004	.0022	.0050	.0000	.11	3.9	....	..
5007	Nov. 11	None	None	None	0.00	6.8	6.1	.0018	.0024	.0040	.0000	.19	3.9	....	..
5323	1908 May 26	V. ft. op.	V.S. fibr.	Mark. stale	0.00	6.9	5.1	.0010	.0006	.0050	.0000	.10	3.9	....	*
7802	1910 Apr. 14	None	V.S. fibr.	Mark. veg.	0.10	.....	.....	.0015	.0030	.004	.0000	.39	2.4	.010	..

\* B. Coli present.

**Madbury.**—

*Examination of Water from Well of John DeMerrit.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
7928	1910 May 27	None	None	.....	.....	.....	.....	.0015	.0005	.0250	.0000	1.60	2.6	.....	..
7952	June 8	None	V. slight	None	0.05	.....	.....	High	.0040	.0500	.0024	5.20	7.4	.....	*

*Examination of Water from Well of W. H. Elliott.*

7929	1910 May 27	None	None	None	0.05	.....	.....	.0015	.0005	.250	.0002	9.8	8.9	.....	..
------	----------------	------	------	------	------	-------	-------	-------	-------	------	-------	-----	-----	-------	----

*Examination of Water from Well Supplying School.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
8344	1910 Aug. 23	None	V. slight	None	0.20	.....	.....	.0010	.0015	.0030	.0000	0.20	1.9	....	*

\* B. Coli present.

**Madison.**—The John F. Chick private water supply was installed in 1905. The source is a spring, excavated two or three feet deep, and the water flows by gravity through about one mile of galvanized iron pipe, both main and service. About fifteen families take this water. There are some private wells within the area.

*Examination of Water from John F. Chick Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
5496	1908 Aug. 11	None	None	None	0.00	4.9	3.0	.0008	.0006	.0150	.0000	.07	2.6	.....	
5497	Aug. 11	None	None	None	0.05	3.3	2.0	.0005	.0000	.0150	.0000	.07	.9	.....	
7466	1909 Oct. 21	None	None	None	0.00	4.5	....	.0015	.0015	.030	.0000	.08	1.2	.....	

**Manchester.**—A water supply was instituted by the city in 1873, was added to in 1886, and supplemented by a high service in 1894. The source is Lake Massabesic, having an area of 2,500 acres, an average depth of 20 feet, and a bottom partly rocky and partly muddy. It has approximately 40 miles of watershed, wooded and cleared about equally. Some sawdust enters the lake. The water is pumped to a reservoir of 15,000,000 gallons' capacity, and an average depth of 20 feet; low service by gravity; high service by steam; 4,000,000-gallon reservoir. There are 110 miles of distributing mains, iron; service pipes are iron, lead lined. The average daily consumption is 3,500,000 gallons; 13,000 families, 99 per cent. of the population, are consumers of this water.

*Examination of Water from Lake Massabesic.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
1902															
369	Jan. 21	None	None	Dec.vg.	0.8	5.70	1.20	.0054	.0204	.0000	.0000	.12	0.7	....	1
370	Jan. 21	None	None	Dec.vg.	0.7	5.50	.70	.0044	.0228	.0000	.0000	.16	0.7	....	2
371	Jan. 21	None	None	Dec.vg.	0.7	5.70	1.00	.0020	.0188	.0000	.0000	.21	0.7	....	3
372	Jan. 21	None	None	Dec.vg.	1.0	9.10	1.60	.0012	.0156	.0000	.0000	.17	0.7	....	..
727	Aug. 22	None	Floc.vg.	Veg.	0.35	7.40	1.30	.0000	.0106	.0000	.0000	.17	1.2	....	..
1903															
1074	Mar. 5	Slight	Fine floc. veg.	Dec.vg.	0.1	3.80	1.00	.0010	.0132	.0040	.0000	.10	0.0	....	3
1075	Mar. 5	Slight	Fine floc. veg.	Dec.vg.	0.7	4.90	1.10	.0000	.0066	.0040	.0000	.11	1.0	....	4
1076	Mar. 5	Slight	Fine floc. veg.	V. dec. vg.	0.75	6.50	1.30	.0000	.0066	.0040	.0000	.15	1.2	....	2
1077	Mar. 5	Slight	Fine floc. veg.	Dec.vg.	0.65	4.80	1.60	.0000	.0066	.0040	.0000	.17	1.4	....	5
1904															
2491	Oct. 26	Slight	M. fine	Dec.vg.	0.4	3.5	1.7	.0000	.0060	.0050	.0000	.22	0.4	....	6
2492	Oct. 26	Slight	M. fine	S. veg.	0.25	3.7	2.3	.0000	.0072	.0050	.0000	.15	0.4	....	*
2493	Oct. 28	Slight	S. fine	Dec.vg.	0.30	3.7	2.7	.0000	.0060	.0050	.0000	.17	0.4	....	2
2494	Oct. 28	V. slight	M. fine	S. veg.	0.35	4.0	1.9	.0000	.0060	.0050	.0000	.15	0.4	....	4
2495	Oct. 28	Slight	M. fine	S. veg.	0.30	3.1	2.0	.0000	.0060	.0050	.0000	.15	0.4	....	7
1905															
3177	Sept. 19	None	None	Arom.	0.20	4.5	1.7	.0006	.0104	.0100	.0000	.20	0.6	....	*
3214	Oct. 4	None	S. fine	Veg.	0.40	3.7	0.8	.0008	.0100	.0050	.0000	.27	0.6	....	8
3215	Oct. 4	S. fine	S. fine	S. veg.	0.20	4.5	1.8	.0008	.0092	.0050	.0000	.27	0.7	....	9
3216	Oct. 4	S. fine	S. fine	Veg.	0.30	5.4	2.4	.0008	.0100	.0050	.0000	.30	0.6	....	2
3217	Oct. 4	None	S. fine	S. veg.	0.20	5.2	2.5	.0008	.0106	.0050	.0000	.30	0.7	....	*
3218	Oct. 4	Slight	Slight	Veg.	0.20	4.0	1.9	.0008	.0084	.0050	.0000	.25	0.7	....	10
3219	Oct. 4	None	Slight	Veg.	0.55	6.9	2.2	.0030	.0084	.0050	.0000	.22	1.1	....	4
1907															
4949	Oct. 15	None	S earthy	None	0.35	4.2	2.0	.0002	.0102	.0040	.0000	.20	0.4	....	11
4950	Oct. 15	None	S. earthy	Argil-lac.	0.35	3.7	1.7	.0008	.0084	.0060	.0000	.18	0.4	....	12
4951	Oct. 15	None	S. earthy	Argil-lac.	0.35	4.7	3.0	.0010	.0084	.0020	.0000	.20	1.2	....	1
4952	Oct. 15	None	S. earthy	None	0.35	4.5	1.7	.0002	.0084	.0006	.0000	.23	0.4	....	13
4953	Oct. 15	None	Slight	None	0.30	3.0	1.5	.0002	.0078	.0100	.0000	.19	0.4	....	8
4954	Oct. 15	V. slight	S. earthy	None	0.35	4.8	1.7	.0010	.0084	.0100	.0000	.22	0.4	....	14
4955	Oct. 15	None	S. earthy	None	0.40	4.6	1.8	.0016	.0078	.0080	.0000	.21	0.4	....	15
4956	Oct. 15	V. S. op.	S. earthy	None	0.30	4.3	1.7	.0012	.0104	.0100	.0000	.23	0.4	....	4
1908															
5165	Mar. 11	None	V. slight	S. earthy	0.50	.....	.....	.0018	.0100	.0100	.0000	.34	0.4	....	*

*Examination of Water from Lake Massabesic.—Concluded.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
5604	1908 Sept. 8	Slight	Sl. fine	Sl. earthy	0.20	6.3	3.2	.0004	.0064	.0020	.0000	.15	.6	....	10
5605	Sept. 8	Slight	Sl. fine	None	0.20	5.7	3.8	.0002	.0058	.0050	.0000	.16	.3	....	8
5606	Sept. 8	V. slight	Slight	None	0.20	5.0	4.5	.0002	.0062	.0050	.0000	.28	.3	....	4
5607	Sept. 8	Slight	Sl. fine	None	0.20	3.4	1.2	.0002	.0066	.0050	.0000	.18	.4	....	16
5608	Sept. 8	V. slight	Slight	Earthy	0.15	3.8	1.0	.0002	.0050	.0060	.0020	.16	.3	....	1
5609	Sept. 8	None	None	None	0.30	5.3	2.8	.0002	.0032	.0040	.0000	.14	.4	....	*13
5654	Sept. 21	None	V. slight	None	0.20	4.5	2.7	.0008	.0076	.0030	.0000	.18	.4	....	..
5653	Sept. 21	None	V. slight	None	0.20	3.7	2.0	.0004	.0060	.0030	.0000	.20	.4	....	..
5732	Oct. 7	None	Slight	None	0.25	3.0	1.6	.0026	.0050	.0050	.0000	.18	.1	....	..
5733	Oct. 7	Marked	Con.	None	0.50	3.0	1.8	.0010	.0100	.0080	.0000	.16	.1	....	..
7524	1909 Dec. 1	None	None	None	0.20	3.7	1.5	.0008	.0085	.005	.0000	.20	.4	....	..
7527	Dec. 1	V. slight	Sl. flocc.	None	0.70	12.0	5.0	.0010	High	.0400	.0000	.80	3.2	....	..
7529	Dec. 1	V. slight	V. slight	Sl. swamp.	0.60	6.5	3.2	.0010	.0140	.0050	.0000	.25	1.2	....	..
7530	Dec. 1	V. slight	V. slight	Sl. swamp.	0.70	7.5	3.5	.0010	High	.0050	.0000	.30	1.9	....	..

<sup>1</sup> High service intake; <sup>2</sup> Deer neck bridge; <sup>3</sup> Half way between Severance Beach and Battery Point; <sup>4</sup> Mouth of Sucker Brook; <sup>5</sup> Front of Judge Emery residence; <sup>6</sup> Between Battery and Rocky Points; <sup>7</sup> Island toward low service intake; <sup>8</sup> Battery Point; <sup>9</sup> Bog, north end of Back Pond; <sup>10</sup> Dam at outlet; <sup>11</sup> Under bridge; <sup>12</sup> Low service outlet; <sup>13</sup> Between Brown and Fletcher islands; <sup>14</sup> Mouth of Merrill Brook; <sup>15</sup> Front of big wharf; <sup>16</sup> Front Pond 400 ft. from wharf; \* B. Coli present.

*Examination of Water from Spring at Stark Park.*

7456	1909 Oct. 20	None	Sl. flocc.	Sl. earthy	1.00	5.5	....	.0025	.0030	.1000	.0004	.60	1.9	....	..
------	--------------	------	------------	------------	------	-----	------	-------	-------	-------	-------	-----	-----	------	----

*Examination of Water from Wells of W. H. McElwain Company.*

5652	1908 Sept. 21	V. S. op.	Slight	Mark. earthy	0.00	12.5	6.8	.0002	.0014	.1000	.0002	1.25	4.6	....	*
5651	Sept. 21	V. S. op.	V. slight	Gaso-line	0.00	21.1	9.2	.0020	.0028	.2200	High	1.66	6.2	....	..
5853	Nov. 20	None	V. slight	None	0.00	....	....	.0025	.0001	.2000	.0000	1.00	3.7	....	..
7277	1909 Aug. 12	None	Sl. earthy	Sl. earthy	0.00	....	....	.0005	.0010	.1000	Trace	2.30	4.9	....	*a
8348	1910 Aug. 12	V. slight	V. slight	Urine	0.05	13.9	9.8	.0030	.0025	.1150	V. High	.55	6.0	....	*
8349	Aug. 12	None	Sl. flocc.	Sl. gaso-line	0.05	14.2	8.0	.0020	.0015	.2250	High	.75	6.0	....	..

\* B. Coli present; a spring.

*Examination of Water from Well of Manchester Battalion  
Rifle Range Association.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
8098	1910 July 12	None	None	Sl. earthy	0.05	.....	.....	.0006	.0010	.0025	.0000	.20	2.9	.....

*Examination of Water from Spring of New Y. M. C. A. Building.*

7774	1910 Apr. 7	V. slight	Sl. earthy	Con. earthy	0.05	.....	.....	.0120	.0041	.2000	High	14.0	12.4	.....
------	----------------	-----------	------------	-------------	------	-------	-------	-------	-------	-------	------	------	------	-------

\* B. Coli present; a spring.

**Marlborough.**—Water is from private springs, average about three feet deep, and flows by gravity through one-inch lead pipe to dwellings.

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
2407	1904 Oct. 3	Slight	Con. flocc.	Musty	0.05	10.6	3.1	.0000	.0000	.0000	.0000	.15	0.3	.....
2408	Oct. 3	None	M. fine	Musty	0.10	15.7	8.1	.0000	.0000	.0000	.0000	.15	0.4	.....
2669	1905 Jan. 30	None	Much	None	0.0	4.1	2.1	.0000	.0000	.0100	.0000	.15	0.4	.056
3647	1906 May 29	None	None	Slight	0.10	2.0	1.0	.0020	.0024	.0100	.0000	.07	....	.....
4553	1907 May 19	None	None	Sl. veg.	0.00	2.9	1.9	.0008	.0016	.0100	.0000	.22	0.9	.....
4999	Nov. 4	None	None	None	0.5	.....	.....	.0002	.0064	.0020	.0000	.17	1.2	.....

**Meredith.**—The Meredith Fire District owns and operates a water supply that was installed in 1894, the source being springs. The water flows by gravity from a reservoir on a hill, 175 feet above the level of the town. The iron main is 4 3-4 miles long; the service pipes are of



galvanized iron. Two hundred families, 85 per cent. of the population, are supplied. There are two public drinking fountains on this system.

*Examination of Water from a Faucet of the Supply of the Meredith Fire District.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
774	1902 Sept. 3	None	None	Dec.vg.	0.2	6.10	1.60	.0020	.0074	.0000	.0000	.12	1.6	....
1296	1903 July 7	Slight	V. slight	M. veg.	0.1	5.00	2.30	.0000	.0038	.0000	.0000	.10	1.6	....
1399	1903 Aug. 3	Marked	M. fine	V. dec. veg.	0.25	6.60	1.90	.0040	.0158	.0300	.0000	.15	1.9	....
1971	1904 May 23	None	None	Sl. veg.	0.25	3.10	1.70	.0022	.0030	.0000	.0000	.15	1.6	....
2688	1905 Feb. 9	None	None	V. slight	0.10	6.0	3.3	.0010	.0000	.0100	.0000	.20	1.8	....
3193	1905 Sept. 25	V. slight	None	Slight	0.20	4.2	2.6	.0010	.0082	.0100	.0000	.10	1.5	....
3427	1906 Jan. 30	None	None	Slight	0.10	4.9	2.6	.0008	.0024	.0050	.0000	.22	1.2	trace
4175	1906 Nov. 21	None	None	V. sl. foul	0.05	4.8	2.3	.0014	.0076	.0100	.0000	.22	1.9	....
4513	1907 May 8	None	V. slight	None	0.10	2.6	1.8	.0012	.0030	.0050	.0000	.17	0.4	.03
5013	1907 Nov. 12	V. slight	V. slight	None	0.25	2.9	1.8	.0002	.0054	.0050	.0000	.32	1.2	....
7553	1909 Dec. 13	V. slight	V. slight	None	0.10	3.2	1.6	.0008	.0070	.005	.0000	.20	1.9	....

**Merrimack.**—No public supply.

*Examination of Water Forwarded by W. H. McElwain Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
7414	1909 Oct. 6	V. slight	V. slight	None	0.40	.....	.....	.0015	.0100	.0050	.0000	.30	1.9	.... <i>a</i>
8177	1910 July 23	Con. op.	V. slight	Clay	0.15	.....	.....	.0006	.0066	.0025	.0000	1.50	1.2	.... <i>b</i>

*a.* Baboosic Brook; *b.* Driven well.

**Milford.**—The public water works of Milford were built in 1890 by John T. Langford and purchased by the town in 1891. There are three collecting wells, two of them about 35 feet in diameter and one 20 feet deep; one somewhat smaller is fed by driven pipes. Soil, gravel with clay bottom. The water is pumped to a standpipe of 250,-000 gallons' capacity.

*Examination of Water from Faucet of Milford Water Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
152	1901 Sept. 9	None	None	None	0.2	5.10	3.20	.0012	.0074	.0120	.0000	.23	....	....
826	1902 Sept. 22	None	None	None	0.1	6.40	3.60	.0000	.0030	.0000	.0000	.13	3.40	....
827	Sept. 22	V. slight	Slight	Slight	0.3	8.00	2.60	.0022	.0066	.0000	.0003	.18	2.60	....
1014	1903 Jan. 28	Slight	None	Veg.	0.1	13.60	4.00	.0000	.0008	.0000	.0000	.17	3.30	....
1400	Aug. 3	V. slight	None	None	0.1	5.60	2.80	.0000	.0040	.0000	.0000	.15	2.40	....
1980	1904 May 23	None	None	Sl. earthy	0.15	5.90	1.40	.0000	.0018	.0000	.0000	.10	1.20	.... *
2080	June 21	Slight	V. mark. flocc. red	V. slight	0.3	6.60	4.60	.0006	.0010	.0000	.0000	.22	4.70	....
2147	July 12	None	V. slight	V. slight	0.3	4.40	1.10	.0026	.0044	.0000	.0000	.20	0.90	.... a
2148	July 12	Marked	V. slight	None	0.1	6.60	2.20	.0014	.0034	.0000	.0000	.17	2.30	.... b
2206	July 26	V. slight	V. slight	V. slight	0.3	3.70	2.40	.0000	.0060	.0000	.0000	.12	1.80	.... c
2208	July 26	None	None	None	0.0	4.90	3.50	.0006	.0000	.0200	.0000	.17	1.10	.... a
2368	Sept. 14	Slight	Slight	V. slight	0.15	4.90	2.90	.0000	.0064	.0000	.0000	.20	1.90	.... d
2369	Sept. 14	Slight	Slight	None	0.3	6.10	2.50	.0000	.0070	.0000	.0000	.15	2.70	.... c
2370	Sept. 15	None	Con. flocc.	Dec. earthy	0.05	5.20	2.40	.0010	.0024	.0000	.0000	.20	2.60	.... b
3163	1905 Sept. 13	V. slight	Slight	None	0.30	7.3	4.4	.0000	.0104	.0100	.0000	.17	2.9	.... c
3164	Sept. 13	V. slight	None	None	0.20	5.5	2.8	.0006	.0054	.0050	.0000	.20	2.3	....
3419	1906 Jan. 30	None	Slight	None	0.10	4.4	3.5	.0008	.0020	.0050	.0000	.20	2.2	.... e
3759	July 17	None	None	None	0.15	5.8	3.3	.0006	.0020	.0100	.0000	.20	1.6	....
4088	Oct. 22	V. slight	V. slight	V. sl. veg.	0.10	4.8	2.8	.0010	.0024	.0050	.0000	.07	1.2	....
4315	1907 Jan. 30	None	V. slight	None	0.00	.....	.....	.0010	.0022	.0050	.0000	.21	1.9	.... *
4356	Mar. 6	None	None	Foreign	0.15	.....	.....	.....	.....	.0050	.0000	.20	0.9	....
5009	Nov. 11	None	None	None	0.10	4.6	3.0	.0002	.0040	.0030	.0000	.31	1.9	....
5307	1908 May 20	None	None	None	0.10	5.8	2.3	.0002	.0024	.0050	.0000	.12	0.9	....

*Examination of Water from Faucet of Milford Water Supply.—Concluded.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
5659	1908 Sept. 21	Mod. op.	Slight	Gas	1.3	7.7	5.6	.0004	.0036	.0040	.0000	.25	2.8	....
5660	Sept. 21	Mod. op.	Slight	M'ked <sup>gas</sup>	0.80	.....	.....	.0002	.0030	.0030	.0000	.20	3.9	....
5661	Sept. 21	Sl. op.	V. slight	None	0.40	6.0	4.3	.0014	.0006	.0050	.0000	.20	1.8	....
5785	Oct. 21	None	None	None	0.20	3.5	2.1	.0010	.0020	.0000	.0000	.17	.9	....
7549	1909 Dec. 8	V. Slight	Slight	None	0.05	3.9	1.7	.0001	.0012	.0100	.0000	.18	1.2	....
7821	1910 Apr. 21	None	None	None	0.10	3.9	2.3	.0005	.0070	.0100	.0000	.35	.9	....
7893	May 17	Cons.	V. heavy ferrug	Veg.	0.10	5.1	3.1	.0010	.0010	.0025	.0000	.30	1.4	.... *f
7894	May 17	None	Sl. earthy	Earthy	0.20	4.0	2.4	.0010	.0070	.0050	.0000	.30	1.6	.... c
7895	May 17	Slight	Sl. fibre	Earthy	0.10	3.6	2.8	.0010	.0040	.0100	.0000	.30	1.2	.... b
7896	May 17	V. slight	Sl. floe.	Earthy	0.50	4.0	2.2	.0030	.0095	.0050	.0000	.30	1.9	....
7936	June 3	None	None	None	0.00	3.0	2.0	.0010	.0010	.0100	.0000	.30	1.2	....

\* B. Coli present; *a* well No. 1; *b* well No. 2; *c* well No. 3; *d* standpipe; *e* tap at pumping station; *f* end of line.

*Examination of Water from Wells of Lovejoy Granite Company.*

7203	1909 July 19	V. ft. op.	V. slight	None	0.00	.....	.....	.0001	.0010	.0500	.0000	.20	1.1	....
7201	July 19	V. slight	V. slight	Sl. earthy	0.10	8.5	5.7	.0002	.0002	.0300	trace	.25	3.2	.... *
7294	Sept. 20	None	None	None	0.00	.....	.....	.0001	.0002	.0400	.0000	.25	.....	....

\* B. Coli present.

*Examination of Water from Well Owned by Hillsborough Mills.*

5840	1908 Nov. 16	None	V. slight	Sl. foul	0.05	.....	.....	.0001	.0025	.0400	.0006	.20	1.2	.037 ..
------	-----------------	------	-----------	----------	------	-------	-------	-------	-------	-------	-------	-----	-----	---------

**Milton.**—*Examination of Water from Spring in Woods, Used by Public.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
5721	1908 Oct 4	None	V. slight	None	0.00	5.3	.....	.0010	.0005	.0050	.0000	.....	.3	.....

*Examination of Water from Well Owned by Spaulding's Sons Company.*

7943	1910 June 6	None	V. slight	None	0.00	.....	.....	.0010	.0015	.0250	.0000	1.85	2.9	.15 ..
------	----------------	------	-----------	------	------	-------	-------	-------	-------	-------	-------	------	-----	--------

**Nashua.**—A private supply, the Pennichuck Water Works, installed by Nashua Aqueduct Company, in 1853, has for a source springs and wells. The wells, from 16 to 52 feet in depth, are driven through alternate layers of marl, sand, fine gravel and coarse gravel, and flow from 20 gallons to 275 gallons per minute. The reservoir, of 4,000,000 gallons' capacity, is 13 feet in depth. There are about 75 miles of cast iron distributing mains; wrought iron, galvanized, is used for service pipes. The average daily consumption is 3,500,000 gallons, by 4,000 families, about 95 per cent. of the population.

*Examination of Water from Pennichuck Water Works Company, Nashua.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
1902														
750	Aug. 26	None	None	Sl. veg.	0.0	6.00	1.50	.0000	.0000	.0000	.0000	.15	1.5	....
1136	Apr. 12	None	Floc.veg.	Sl. veg.	0.0	4.00	2.70	.0000	.0010	.0150	.0000	.17	2.0	....
1137	Apr. 12	None	None	None	0.0	3.80	2.20	.0000	.0000	.0000	.0000	.15	2.4	....
1395	July 3	Slight	Floc.veg.	V. dec.	0.08	4.30	2.30	.0000	.0048	.0000	.0000	.20	2.2	....
1396	July 3	Slight	Floc.veg.	V. dec. veg.	0.08	5.20	2.50	.0000	.0024	.0000	.0000	.20	2.2	....
1904														
1978	May 23	V.mark.	Sl. fine	S.musty	0.6	4.10	1.10	.0000	.0024	.0350	.0000	.22	0.9	....
2384	Sept.19	Slight	Con.fine	V. dec. veg.	0.2	4.40	2.70	.0000	.0024	.0000	.0000	.20	1.4	....
2500	Oct. 31	None	S. fine	V. slight	0.0	5.7	4.0	.0000	.0020	.0000	.0000	.20	2.6	....
1905														
2682	Feb. 6	None	None	Earthy	0.1	4.2	1.9	.0000	.0000	.0100	.0000	.17	1.8	....
3180	Sept.19	Slight	None	Veg.	0.15	6.3	2.8	.0034	.0082	.0050	.0000	.17	1.9	....
1906														
3445	Feb. 6	None	None	Veg.	0.10	3.7	2.7	.0008	.0030	.0050	.0000	.22	2.0	....
3820	Aug. 7	V. slight	V. slight	Veg.	0.03	6.0	5.0	.0010	.0064	.0050	.0000	.20	1.4	....
4178	Nov.23	None	None	Earthy	0.05	5.0	4.0	.0010	.0054	.0050	.0000	.25	0.19	....
1907														
4294	Jan. 24	None	None	None	0.00	.....	.....	.0010	.0006	.0000	.0000	.07	2.7	....
5025	Nov.15	None	None	Earthy	0.10	3.9	3.3	.0008	.0024	.0020	.0000	2.3	1.9	....
1908														
5117	Jan. 21	None	None	None	0.00	3.3	2.7	.0008	.0008	.0060	.0000	.21	2.5	....
5915	Dec. 30	Ft. op.	None	None	0.00	.....	.....	.0005	.0015	.0000	.0000	.18	1.2	....
1909														
6008	Mar.13	None	None	Sl. earthy	0.10	3.1	2.0	.0010	.0035	.0100	.0000	.18	1.4	....
1910														
7857	May 2	V. slight	Mod.veg.	Sl. swamp	0.70	4.0	2.0	.0035	.0100	.0020	.0000	.30	2.0	.025 ..

*Examination of Water from Ponds Owned by Nashua Coal and Ice Company.*

7487	1909 Oct. 28	None	Sl. veg.	Con. earthy	0.30	.....	.....	.0015	.0130	.0050	.0000	.25	1.9	.... *
7488	Oct. 28	None	None	Sl. earthy	0.40	.....	.....	.0045	.0170	.0050	.0000	.20	1.5	....

\* B. Coli present.



*Examination of Water from Pond Owned by George E. Balcom.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
489	1909 Oct. 28	Sl. opal.	Mod. flocc.	Arom.	0.30	.....	.....	High	High	.0050	.0000	.40	.4	.....

*Examination of Water from Danforth Spring—Supply of Highland Sanitarium.*

4374	1907 Mar. 18	None	V. slight	Sl. foul	0.00	9.8	7.8	.0046	.0020	.3700	trace	.68	3.6	.... *
5118	1908 Jan. 21	None	None	None	0.00	6.8	4.0	.0012	.0016	.0200	.0000	.65	3.2	.... ..
5119	Jan. 21	None	None	None	0.05	6.8	4.4	.0006	.0012	.0150	.0000	.64	3.2	.... ..

\* B. Coli present.

*Examination of Water from Harris Pond.*

5116	1908 Jan. 21	None	None	Hay-like	0.50	2.0	1.7	.0004	.0054	.0100	.0000	.19	1.2	.... *
------	-----------------	------	------	----------	------	-----	-----	-------	-------	-------	-------	-----	-----	--------

\* Colon B. present.

*Examination of Water from Nashua River.*

4293	1907 Jan. 24	Mod. op.	Mod.	Musty	0.30	.....	.....	.0240	.0120	.0000	.0000	.60	2.6	.... *
------	-----------------	----------	------	-------	------	-------	-------	-------	-------	-------	-------	-----	-----	--------

\* Colon B. present.

**New Boston.**—The New Boston Creamery furnishes water from Grist Mill Pond; the latter is of small area and hard bottom. The water flows by gravity through eight-inch pipe from pond forced through pump, eight-foot head. This water is furnished for fire hydrants, and to eight families, but is not used for drinking or in food. Drinking water is from wells and springs.

*Examination of Water from Grist Mill Pond.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
4506	1907 May 6	None	V. slight	None	1.60	5.4	2.4	.0014	.0090	.0150	.0000	.28	0.9	pres ent
5020	Nov. 19	None	None	None	0.80	3.9	2.7	.0004	.0104	.0050	.0000	.26	0.4	high

*Examination of Water from Well Supplying Presbyterian Church.*

7441	1909 Oct. 15	None	None	Earthy	0.00	.....	.....	.0002	.0008	.0050	.0000	1.0	3.2	high
------	--------------	------	------	--------	------	-------	-------	-------	-------	-------	-------	-----	-----	------

*Examination of Water from Stream Owned by G. C. Warren.*

7962	1910 June 15	V. slight	V. slight	Swampy	1.4	5.0	1.9	.0050	.0060	.0050	.0000	1.35	1.5	high
------	--------------	-----------	-----------	--------	-----	-----	-----	-------	-------	-------	-------	------	-----	------

*Examination of Water from Supplies of J. Reed Whipple.*

7650	1910 Feb. 10	V. slight	V. slight	Con. swampy	0.70	.....	.....	.0008	.0130	.0000	.0000	.06	1.9	high	a
7961	June 21	None	None	V. slight	0.00	8.0	5.3	.0010	.0010	.1000	.0000	.95	5.0	high	b

a Spring receives surface drainage; b well.

**Newbury.**—Private parties supply running water from springs to the summer cottages at Blodgett's Landing. Another party supplies his own and two or three other cottages from a well.

*Examination of Water from Blodgett Spring, Blodgett's Landing.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
4520	1907 May 10	None	None	None	0.00	5.3	4.3	.0018	.0018	.0200	.0000	.49	2.3	.....
5610	1908 Sept. 18	None	None	None	0.00	.....	.....	.0006	.0002	.0200	.0000	.20	1.2	.....

**Newfields.—***Examination of Water from a Well Opposite Railroad Station.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
7660	1910 Feb. 3	None	Sl. earthy	Ft. swamp.	0.00	.....	.....	.0006	.0024	.150	.0000	.70	3.1	.....	..

*Examination of Water from Well of Methodist Parsonage (Used by School Children).*

7659	1910 Feb. 31	None	Sl. flocc.	Sl. earthy	0.00	.....	.....	.0008	.0014	.3000	.0000	1.75	2.6	.....	..
------	-----------------	------	------------	------------	------	-------	-------	-------	-------	-------	-------	------	-----	-------	----

*Examination of Water from Well of George S. Littlefield.*

7662	1910 Feb. 13	None	Slight	None	0.05	.....	.....	.0002	.0034	.450	.0000	2.44	5.	.....	..
------	-----------------	------	--------	------	------	-------	-------	-------	-------	------	-------	------	----	-------	----

*Examination of Water from Well of Old Newfields Tavern.*

7661	1910 Feb. 13	None	None	None	0.00	.....	.....	.0008	.0042	.7000	.0000	2.12	6.0	.75	..
------	-----------------	------	------	------	------	-------	-------	-------	-------	-------	-------	------	-----	-----	----

**New Hampton.**—During 1910 the precinct inaugurated a supply, the source being Mountain Pond. The latter is a sheet of water of about 30 acres area, 10 to 40 feet deep, situated at a considerable altitude about one mile from any habitation, and with no pasturage near pond, brook or reservoir. The pond is fed by springs, and has a hard, clean bottom. The shores of this as well as the bed of the brook, (one mile long) leading to the distributing reservoir, have been recently cleaned. The reservoir has a capacity of 5,000,000 gallons, with an average depth of five feet. About two miles of cast iron mains have been laid, with services of galvanized iron. It is expected that the system will be placed in operation about September 1.

*Examination of Water from Mountain Pond.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
5277	1908 May 4	Slight	S. flocc.	S. stale	0.15	3.5	1.9	.0016	.0044	.0030	.0000	.09	0.4	.....
5278	May 4	Mod'ate	S. flocc.	Slight	0.10	2.4	1.2	.0018	.0066	.0050	.0000	.09	0.4	.....
5297	May 18	V. slight	S. flocc.	None	0.15	2.5	1.3	.0006	.0024	.0050	.0000	.08	0.3	.....
5495	Aug. 12	V. slight	V. slight	None	0.20	.....	.....	.0005	.0113	.0050	.0000	.....	.....	.....
5796	Oct. 23	None	V. slight	Slight	0.15	2.4	.30	.0020	.0090	.0000	.0000	.08	.30	.....
5884	Dec. 10	V. slight	V. slight	Sl. musty	0.10	2.9	1.5	.0040	.0100	.0000	.0000	.09	.30	.....
6012	1909 Mar. 1	V. faint	V. slight	Slight	0.10	2.7	1.4	.0060	.0070	.0050	.0000	.08	.10	.....

**New Ipswich.**—*Examination of Water from Well of Congregational Church, Smithville.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
7228		V. S. op.	V. slight	None	0.05	.....	.....	.0010	.0020	.1500	.0006	.4	4.6	.05 *

\* B. Coli present.

**New London.**—This town has no public supply as yet, the matter of the Morgan Pond system contemplated being still in abeyance. The supply is from a private system owned by C. E. Shepard, consisting of two bored wells, 305 and 219 feet deep, respectively, the water being pumped to a reservoir of 30,000 gallons. One mile is of galvanized iron mains with services of the same material. About 20 per cent. of the population is thus supplied, including Colby Academy, two stores, a hotel and ten families. Two or three families are supplied by C. W. Converse with water pumped from Sunapee Lake.

*Examination of Water from Morgan Pond.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
3931	1906 Aug. 28	None	S. veg.	S. veg.	0.50	5.0	2.2	.0026	.0134	.0000	.0000	.05	0.7	.... ..
3932	Aug. 28	None	S. veg.	S. veg.	0.60	6.0	2.8	.0390	.0170	.0000	.0000	.10	0.9	.... *a

\*B. Coli present; a Brook flowing from Morgan Pond.

*Examination of Water from Stream on Land of H. W. Kidder—Twin Lake Village Supply.*

4839	1907 Aug. 26	None	None	None	0.3	.....	.....	.0002	.0052	.0050	.0000	.10	1.9	.... ..
------	-----------------	------	------	------	-----	-------	-------	-------	-------	-------	-------	-----	-----	---------

*Examination of Water from Wells of Soo-Nipi Park Company.*

5047	1907 Dec. 2	None	None	None	0.00	.....	.....	.0014	.0026	.0080	.0000	1.93	6.7	h'gh ..
5056	Dec. 2	Sl. op.	V. slight	None	0.20	.....	.....	.0040	.0038	.0100	V. high	2.29	4.6	.... ..

*Examination of Water from Reservoir Owned by C. E. Shepard.*

5922	1909 Jan. 4	None	V. slight	None	0.05	8.5	6.4	.0005	.0005	.0050	.0000	.09	2.9	.... a
7796	1910 Apr. 13	V. slight	V. slight	None	0.00	7.3	4.6	.0015	.0040	.0050	.0000	.35	2.9	.... b
7838	Apr. 25	V. slight	V. slight	Sl. earthy	0.05	7.3	6.7	.0015	.0010	.0050	.0000	.05	3.3	.... a

a Tap from reservoir; b well.

*Examination of Water from Well Owned by Colby Academy.*

5940	1909 Jan. 18	Mod.	Con. earthy	Con. earthy	0.20	.....	.....	.0090	high	.0400	.0040	12.2	2.6	.... *
------	-----------------	------	-------------	-------------	------	-------	-------	-------	------	-------	-------	------	-----	--------

\* B. Coli present.

*Examination of Water from Lake Sunapee.*

7172	1909 July 8	None	None	None	0.10	3.3	1.8	.0002	.0050	.0000	.0000	.09	.3	.... ..
------	----------------	------	------	------	------	-----	-----	-------	-------	-------	-------	-----	----	---------



**Newmarket.**—The public water supply, owned by the town, was built in 1894. The water, from a stream, is pumped to a standpipe of 22,000 gallons' capacity. There are seven miles of cast iron distributing mains, and the service pipes are of galvanized iron. The average daily consumption is 150,000 gallons. About 90 per cent. of the population are supplied from this system, but some private wells are still in use. (See special report elsewhere.)

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
2952	1905 July 3	None	Clayey	Earthy	0.35	7.1	5.8	.0000	.0042	.0000	.0000	.30	2.8	....	*
3444	1906 Feb. 6	S. op.	None	None	0.10	7.7	5.2	.0006	.0028	.0100	.0000	.35	1.9	....	
4678	1907 July 3	S. op.	V. slight	None	0.35	6.3	4.3	.0010	.0074	.0150	.0000	.28	2.9	....	*
4916	Oct. 2	Mod. op.	V. slight	S. earthy	0.60	6.4	3.6	.0002	.0100	.0050	.0000	.37	1.9	....	
7351	1909 Sept. 14	Mod. op.	Sl. fib'y	Mkd. earthy	0.30	10.0	6.5	.0010	.0060	.0050	.0000	.40	3.2	....	*
7356	Sept. 14	None	V. slight	Sl. earthy	0.10	6.1	2.6	.0025	.0100	.0050	.0000	.40	1.5	....	
7360	Sept. 14	Mod. op.	Mod. earthy	Mkd. earthy	0.40	.....	.....	.0015	.0065	.0050	.0000	.30	2.8	....	
7817	1910 Apr. 20	Slight	None	Clayey	0.30	4.9	4.3	.0022	.0085	.0075	.0000	.40	1.4	....	*

\* B. Coli present.

**Newport.**—The town owns and operates a system of water works, installed in 1894, supplied by a pond, or lake, of 66 acres; average depth about thirty feet; bottom largely sand and rock. The watershed is about four or five square miles, about two thirds wooded; three families reside thereon. There are also one or two individuals who sell spring water.

The public supply is a gravity system, with eight miles of cast iron mains, and wrought iron, cement-lined service pipes. Perhaps five hundred families take this water. There are not many private wells.

*Examination of Water from Tap of Town Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
844	1902 Oct. 9	None	None	Veg.	0.1	6.90	1.20	.0000	.0048	.0000	.0004	.10	.9	....
2013	1904 June 2	None	None	S. musty	0.1	4.10	2.50	.0000	.0036	.0000	.0000	.15	1.6	....
3448	1906 Feb. 6	V. slight	V. slight	S. veg.	0.1	2.8	1.4	.0026	.0070	.0050	.0000	.12	0.4	....
4225	Dec. 10	Mod. op.	Slight	Slight	0.1	5.0	2.5	.0008	.0092	.0050	.0000	.08	....	....
4516	1907 May 8	None	V. slight	None	0.10	3.4	2.5	.0024	.0046	.0050	.0000	.13	0.9	....
5065	Dec. 6	None	None	None	0.20	4.2	2.7	.0012	.0074	.0120	.0000	.05	.04	....
5989	1909 Feb. 6	None	None	Sl. earthy	0.05	3.0	1.5	.0010	.0060	.0050	.0000	.09	.7	....

*Examination of Water Supplying Draper & Company, North Newport.*

7273	1909 Aug. 11	Mod.	Slight	V. slight earthy	0.05	....	....	.0060	.0025	.0200	High	.10	6.1	0.5	a
7428	Oct. 6	None	V. slight	None	0.00	....	....	.0050	.0001	.5000	.0006	.60	4.2	....	..
7559	Dec. 16	V. slight	V. slight	None	0.05	....	....	.0010	.0008	.0500	.0000	.08	4.7	trace	b
7558	Dec. 16	V. slight	V. slight	None	0.05	....	....	.0001	.0008	.0500	.0000	.08	4.6	....	c

a Well; b well trough lead pipe; c well without pipe.

**Northfield.**—(See Tilton for analysis of supply).

**Northumberland.**—Groveton Village Precinct incorporated a system of public water works in 1894, from streams. There are two watersheds, of wooded land mainly, with no inhabitants. The source of the supply is in the mountain-side, and the water flows by gravity through about four miles of cast iron mains; service pipes are of galvanized iron. The entire precinct is supplied from this system. There are two or three private wells within the radius of this supply.

Northumberland Falls is supplied by a private water company.

*Examination of Water from Groveton Village Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
4204	1906 Nov. 30	None	V. slight	Sl. earthy	0.10	4.0	2.5	.0008	.0054	.0050	.0000	.15	1.2	....	*
4532	1907 May 13	None	None	None	0.10	2.3	1.5	.0004	.0046	.0100	.0000	.14	0.7	....	..
5068	Dec. 9	None	None	None	0.00	2.7	1.4	.0008	.0032	.0200	.0000	.09	0.4	....	..
6080	1909 Mar. 5	None	None	None	0.00	2.3	1.4	.0010	.0015	.0300	.0000	.08	.10	....	..
7537	Dec. 2	None	None	Sl. earthy	0.00	3.0	1.8	.0005	.0020	.0100	.0000	.05	.60	....	..

\* B. Coli present.

*Examination of Water Supplying Odell Manufacturing Company.*

5708	1908 Sept. 29	None	None	None	0.00	.....	.....	.0010	.0020	.0050	High	.08	.....	.....	a
5709	Sept. 29	None	None	None	0.60	.....	.....	.0008	.0076	.0020	.0000	.10	.....	.....	b

a Spring; b brook.

**Northwood.**—No public supply.**Nottingham.**—All get water from wells and springs.*Examination of Water from Well Used by General Public at Nottingham.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
3020	1905 July 26	None	V. slight	None	0.0	5.7	3.5	.0008	.0022	.0200	.0000	.27	1.4	....	..

**Orange.**—The supply is wholly from private wells and springs.

**Orford.**—No public supply. There are private supplies from springs, which furnish water to some 30 families. These springs are dug from six to eight feet deep, through sandy loam, subsoil rock. The water flows by gravity through iron and lead mains, with lead for service pipes. There are no individual wells in the vicinity. There are several other private springs.

*Examination of Water Supplying Schools.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
7064	1909 May 27	Sl. op.	V. slight	None	0.15	.....	.....	.0008	.0045	.0050	.0000	.05	3.1	.....	a
7914	1910 May 24	Sl. op.	V. slight	Mkd. veg.	0.10	5.0	3.4	.0140	.0040	.0370	.0000	.10	3.1	.062	b

a Well in pasture; b spring.

**Ossipee.**—This town has no public supply. During 1909 Mr. C. A. Wiggin forwarded a sample of water for examination, taken from "reservoir" at Duncan Lake, it being the intention to install a supply for the use of the cottagers.

*Examination of Water from Reservoir of C. A. Wiggin.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
7032	1909 May 13	None	Slight	Slight	0.00	3.3	2.0	.0005	.0015	.0050	.0000	.13	.3	.....	...

**Pembroke.**—There are two private supplies. The Suncook Water Works, built in 1896, is supplied from a pond having an area of 25 acres, and located eight miles from the village; no inhabitants within two or three miles. The water, which flows by gravity, is taken from a collecting reservoir, located five miles from town and formed by the damming of a brook flowing from the pond. The area flowed has be-

come swamp-like in character, none of the surface growth having been removed, and as a result, this supply is the most highly colored in the state. There are nine miles of distributing mains, cast iron; service pipe of galvanized iron. About 50 per cent. of the population is supplied from this source. The Baker & Dearborn Water Works were built in 1895, the source being a spring and Suncook River. The latter receives all the sewage of Pittsfield, 16 miles above. The river water is pumped to three reservoirs, 150 x 20, 50 x 20, and 50 x 20, and nine feet deep, respectively. The distributing main is one mile in length and is of wrought iron; service pipes of galvanized iron. About 10 per cent. of the population take from this supply.

*Examination of Water from Suncook Water Works.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
1903														
1331	July 14	None	Floc. veg.	S. veg.	1.5	6.10	0.90	.0028	.0248	.0000	.0000	.15	0.6	.....
1583	Oct. 12	None	None	S. veg.	0.7	5.90	1.00	.0000	.0126	.0000	.0000	.17	0.6	.....
1904														
1932	May 8	None	None	Mkd. veg.	0.85	2.00	0.40	.0020	.0102	.0000	.0000	.12	0.4	.....
1905														
2658	Jan. 23	None	None	Veg.	1.2	8.0	2.1	.0000	.0134	.0200	.0000	.20	1.9	.....
2729	Feb. 27	None	None	Slight	0.7	5.8	2.6	.0104	.0046	.0000	.0000	.27	1.5	.....
2961	July 6	None	Con. floc.	S. veg.	1.6	5.5	1.7	.0000	.0104	.0000	.0000	.12	1.2	.....
3278	Oct. 31	None	None	Arom.	1.2	6.7	2.7	.0028	.0136	.0050	.0000	.22	1.5	.....
1906														
3840	Aug. 14	V. slight	Mod'ate	None	1.2	4.5	2.0	.0044	.0190	.0100	.0000	.07	....	..... *
4164	Nov. 16	V. slight	V. slight	S. veg.	0.60	5.0	3.5	.0024	.0064	.0050	.0000	.10	1.2	.....
4399	Apr. 4	None	None	S. veg.	0.80	2.8	1.1	.0016	.0076	.0800	.0000	.14	1.0	.....
4895	Oct. 25	None	None	S. veg.	1.40	7.2	2.6	.0002	.0300	.0000	.0000	.06	0.4	.....
1908														
5166	Mar. 13	V. faint	V. slight	None	0.60	3.3	1.7	.0006	.0090	.0120	.0000	.20	1.2	.....
5523	Aug. 18	None	None	Swampy	1.60	8.3	1.8	.0012	High	.0080	.0000	.16	1.1	..... *
5683	Sept. 24	None	V. slight	None	0.30	3.2	1.4	.0002	.0090	.0020	.0000	.11	.4	.....
1910														
7696	Mar. 9	V. slight	V. slight	Sl. swampy	0.10	4.4	1.5	.0002	.0086	.0050	.0000	.22	.4	.....

\* B. Coli present.



*Examination of Water from Baker & Dearborn Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
1584	1903 Oct. 12	Slight	V. slight	S. foul	0.2	3.60	1.90	.0020	.0026	.0000	.0000	.20	2.4	....
3269	1905 Oct. 30	None	Slight	None	0.3	4.6	2.6	.0010	.0050	.0100	.0000	.56	0.6	.... *
3319	1907 Nov. 28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.50	.....	.... *
3846	1906 Aug. 14	None	V. slight	None	0.1	4.4	3.4	.0014	.0062	.0100	.0000	.25	.22	.....
4146	1907 Nov. 13	None	None	None	0.15	4.3	3.1	.0010	.0080	.0200	.0000	.22	.9	.....
4400	1907 Apr. 4	None	None	None	0.00	3.4	1.7	.0034	.0076	.0270	.0000	.20	1.2	.....
4894	1908 Oct. 26	Sl. op.	V. slight	Clayey	0.05	4.4	2.9	.0002	.0024	.0000	.0000	.17	.7	.....
5170	1908 Mar. 16	None	V. slight	None	0.05	3.0	2.0	.0004	.0002	.0100	.0000	.17	1.2	.....
7707	1910 Mar. 10	Sl. op.	V. slight	Earthy	0.00	6.0	2.9	.0006	.0020	.0050	.0000	.09	2.0	.....

\* B. Coli present.

*Examination of Water from Wells Supplying Pembroke Academy.*

7337	1909 Sept. 3	None	None	None	0.00	.....	.....	.0001	.0005	.1500	.0000	.70	1.6	.030 ..
6003	1909 Feb. 23	None	None	None	0.00	.....	.....	.0020	.0010	.2000	.0000	6.3	11.5	trace ..
7504	1910 Oct. 3	V. slight	V. slight	Slight	0.00	2.5	.....	.0010	.0020	.0100	.0000	.70	1.9	.... *
7760	1910 Apr. 6	None	None	None	0.00	.....	.....	.0004	.0008	Very high	.0000	6.62	12.4	.0 ..
7852	1910 Apr. 30	V. slight	Sl. flocc.	Sl. clay.	0.05	5.4	3.5	.0015	.0030	.0650	.0000	.65	.6	.....

\* B. Coli present.

*Examination of Water from Well Owned by Suncook Mills.*

7803	1910 Apr. 14	None	V. slight	None	0.10	.....	.....	.0002	.0051	High	.0005	1.15	3.4	V ry h'gh ..
------	-----------------	------	-----------	------	------	-------	-------	-------	-------	------	-------	------	-----	--------------

**Peterborough.**—In 1896 the town installed a water supply from a brook fed by springs. The watershed is three miles by one mile in extent, consisting of pasturage and woodland. It is a gravity system of approximately ten miles of distributing mains, iron; service pipes of iron, cement lined. There are quite a number of wells still in use, but they are gradually being given up.

*Examination of Water from Tap of Town Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
851	1902 Oct. 10	None	None	Dec. veg.	0.4	6.30	1.80	.0000	.0062	.0000	.0000	.12	1.8	.....
1427	1903 Aug. 10	None	V. slight	S. veg.	0.4	7.70	1.70	.0000	.0098	.0000	.0000	.10	1.6	.....
1452	Aug. 17	None	V. slight	V. s. vg.	0.32	5.00	2.00	.0000	.0072	.0000	.0000	.10	1.9	.....
1979	1904 May 23	None	None	None	0.3	3.50	0.50	.0000	.0046	.0000	.0000	.10	0.7	.....
2467	Oct. 20	None	M. fine	S. musty	0.30	3.6	1.0	.0000	.0080	.0000	.0000	.10	0.7	.....
2468	Oct. 20	None	None	V. slight	0.40	4.9	3.0	.0000	.0046	.0000	.0000	.25	2.0	.....
2697	Feb. 14	None	None	V. slight	0.25	3.7	2.0	.0010	.0034	.0200	.0000	.12	0.6	.....
3197	Sept. 25	None	None	None	0.40	5.3	3.0	.0006	.0096	.0050	.0000	.15	1.9	.....
3447	1906 Feb. 5	None	None	None	0.10	3.0	1.2	.0010	.0032	.0050	.0000	.17	0.3	.....
4199	Nov. 28	None	V. slight	None	0.10	2.5	1.0	.0030	.0084	.0050	.0000	.12	0.4	.....
4200	Nov. 28	None	None	None	0.30	3.3	1.2	.0014	.0084	.0050	.0000	.20	1.2	.....
4531	1907 May 13	None	None	Veg.	0.40	3.0	1.8	.0004	.0060	.0050	.0000	.05	0.9	.....
4973	Oct. 21	None	None	None	0.40	5.0	2.9	.0004	.0058	.0070	.0000	.20	0.4	.....
7260	1909 Aug. 9	Slight	Mod. flocc.	V. Sl. veg.	.30	4.2	2.5	.0001	.0095	.0050	.0000	.10	.7	.....
7528	Dec. 1	None	None	None	0.40	4.3	1.8	.0002	.0060	.0050	.0000	.10	.6	.....
7575	Dec. 24	V. slight	Sl. flocc.	Sl. earthy	0.05	3.0	1.0	.0005	.0080	.0000	.0000	.05	.3	.....
7576	Dec. 24	V. slight	V. slight	None	0.30	3.0	2.5	.0001	.0070	.0000	.0000	.05	.9	.....
7822	1910 Apr. 21	None	None	None	0.40	3.6	1.8	.0025	.0082	.0075	.0000	.20	.6	.....

**Pittsfield.**—The Pittsfield Aqueduct Company installed a system of water works in 1884. The source is a pond one-half mile long and an average of one-eighth mile wide; average depth some ten feet,

bottom largely stone and gravel. A little more than half the watershed, one mile by three fourths of a mile, is wooded; not over six permanent inhabitants. This pond has no visible inlet, but is fed from its own bottom.

The force is gravity, through an open brook, for a mile descending constantly, over a gravelly and rocky bottom; capacity of reservoir, 1,500,000 gallons. There are four miles of distributing mains, largely cement lined; service pipes, cement lined, plain iron, and galvanized iron. Four hundred families, substantially the whole village, are takers. Very few wells within the area.

*Examination of Water from the Pittsfield Aqueduct Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
1112	1903 Mar.30	Distinct	Much fine	Veg.	0.2	3.90	1.70	.0024	.0046	.0100	.0001	.15	0.7	....
1117	Apr. 1	Distinct	Much fine	Veg.	0.22	5.30	2.30	.0000	.0042	.0150	.0000	.15	1.4	....
1456	Aug. 19	V. slight	V. slight	Decided veg.	0.22	2.70	1.10	.0000	.0068	.0000	.0000	.15	1.1	....
1984	1904 May 24	Slight	Sl. fine	Slight musty	0.15	8.00	3.20	.0020	.0046	.0000	.0000	.13	1.9	....
2750	1905 Mar.13	None	None	None	0.1	6.0	4.0	.0096	.0050	.0150	.0005	.15	0.3	....
3194	Sept.25	None	Slight	Foul	0.15	2.9	1.6	.0008	.0084	.0050	.0000	.17	1.2	....
3456	1906 Feb. 12	None	V. slight	Veg.	0.10	2.80	2.0	.0014	.0074	.0050	.0000	.42	0.7	....
3878	Aug. 22	None	Con.	Earthy	0.20	5.7	1.4	.0016	.0192	.0000	.0000	.12	0.1	.... a
3879	Aug. 22	Cons.	Con.	S. earthy	0.20	6.0	1.9	.0028	.0184	.0000	.0000	.12	0.1	.... b
4526	1907 May 13	None	V. slight	Musty	0.15	5.2	2.6	.0014	.0320	.0050	.0000	.24	0.7	....
5064	Dec. 11	None	None	Sl. foul	0.40	2.8	2.3	.0006	.0084	.0100	.0100	.15	0.4	.... *
5984	1909 Feb. 10	Slight	Sl. veg.	Sl. earthy	0.10	3.4	1.9	.0020	.0060	.0100	.0000	.17	.2	....
7131	June 23	V. slight	None	Earthy	0.05	.....	.....	.0005	.0035	.0300	.0000	.11	.4	....
7534	Dec. 2	None	None	None	0.05	3.0	1.3	.0010	.0065	.0050	.0000	.20	.7	....

\* B. Coli present; a from pond; b from reservoir.

**Plainfield.**—A private supply was introduced in 1890-91 by the Meriden Water Company. The source of the supply is springs dug from 7 to 10 feet deep, and flowing from 10 to 30 gallons per minute.

The watershed has an area of about 100 acres, all cleared. The water flows by gravity to two reservoirs, one 20 x 25 x 8 feet, and having a capacity of 1,000 barrels; the other 13 feet in diameter by 12 feet deep; plain wrought iron pipe. Twenty families, besides the hotel and boarding house, are supplied from this source. There are many individual wells in the locality.

*Examination of Water of Meriden Water Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
860	1902 Oct. 13	Marked	Much min.	Slight	0.1	10.00	5.0	.0000	.0000	.0000	.0000	.06	4.5	....
1974	1904 May 23	None	None	S. earthy	0.0	5.60	4.7	.0024	.0038	.0300	.0000	.10	4.5	....
2595	Dec. 14	None	None	None	0.00	7.0	5.1	.0000	.0014	.0300	.0000	.30	3.7	....
2691	1905 Feb. 9	None	S. fine	None	0.05	9.2	6.0	.0000	.0000	.0150	.0000	.12	3.5	....
3179	Sept. 19	Slight	None	None	0.10	6.4	4.4	.0010	.0082	.0050	.0000	.05	3.1	....
3201	Sept. 27	None	Slight	S. earthy	0.10	14.6	11.4	.0008	.0064	.2000	.0000	.57	8.2	.... a
3432	1906 Feb. 1	None	None	None	0.0	6.7	4.3	.0008	.0014	.0080	.0000	.05	2.6	....
4041	Oct. 2	None	Slight	Sl. veg.	0.10	13.2	11.2	.0010	.0030	.0050	.0000	.05	7.4	....
4042	Oct. 2	None	Sl. fine	Veg.	0.10	15.5	13.5	.0028	.0041	.0100	.0000	.05	8.3	....
4176	Nov. 21	V. sl. op.	V. slight	Sl. foul	0.20	9.0	6.0	.0010	.0056	.0100	.0000	.42	5.3	.... *
4493	1907 Apr. 30	None	None	None	0.00	5.5	4.0	.0004	.0018	.0120	.0000	.09	2.9	....
5054	Nov. 27	None	None	Sl. veg.	0.00	5.8	4.8	.0014	.0028	.0150	.0000	.18	3.2	....
5055	Dec. 3	None	None	None	0.20	.....	.....	.0002	.0048	.0060	.0000	.20	3.9	....
5685	1908 Sept. 24	Con.	Con. earthy	Mark. foul	Clo udy	.....	.....	.0070	.0062	.0040	.0000	.25	.....	.... b
5687	Sept. 24	V. slight	Sl. earthy	Sl. marshy	0.05	.....	.....	.0046	.0036	.0040	.0001	.10	.....	....
5774	Oct. 20	Mark. op.	Med. clay	None	Clo udy	15.0	11.8	.0010	.0080	.0000	.0000	.05	7.1	.... c
5842	Nov. 17	None	Sl. earthy	Sl. earthy	0.00	10.0	7.2	.0010	.0020	.0000	.0000	.05	5.6	.... c
7497	1909 Oct. 28	Slight	Sl. earthy	None	0.05	12.2	7.7	.0010	.0045	.0050	.0000	.12	6.7	....
7820	1910 Apr. 20	None	Sl. earthy	Earthy	0.00	4.1	2.7	.0012	.0030	.0100	.0000	.15	2.0	....

a Pond supplying ice; \* B. Coli present; b well in Freeman's pasture, supplies K. U. A; c hole in O. A. Stearn's field.

**Plaistow.—***Examination of Water from Stream, Proposed Public Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites			
340	1910 Aug. 23	V. slight	V. slight	Musty	0.30	.....	.....	.0030	High	.0050	.0000	.30	1.9	.....

**Plymouth.**—The town installed a system of water works in 1880 and 1881, the supply being from springs and wells. The average depth of the wells is six feet. A foot of top soil is loam; below the loam is marl and gravel. The wells are dug. The water flows by gravity to two reservoirs having a capacity of 4,000,000 gallons; area, one acre; average depth, 12 feet. There are six miles of cement lines, and two miles of cast iron mains, with galvanized iron service pipes. Fifteen per cent. of the population take this water.



*Examination of Water from Town Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
627	1902 June 30	V. slight	None	Veg.	0.25	8.00	3.10	.0000	.0054	.0000	.0000	.10	2.3	....	*
629	June 30	Slight	Slight	Veg.	0.26	7.80	3.10	.0006	.0084	.0000	.0000	.12	2.3	....	†
630	June 30	Slight	Slight	Dec. vg.	0.26	8.10	2.00	.0006	.0120	.0000	.0000	.07	1.9	....	‡
631	June 30	Slight	None	Dec. vg.	0.26	6.40	2.50	.0000	.0072	.0000	.0000	.07	1.9	....	h
1406	1903 Aug. 5	V. slight	Slight	V. slight	0.2	5.00	2.70	.0000	.0066	.0000	.0000	.07	2.4	....	..
1585	Oct. 12	None	V. slight	None	0.25	7.40	4.70	.0016	.0052	.0150	.0000	.20	3.1	....	k
1586	Oct. 12	None	Slight	None	0.2	7.10	3.80	.0000	.0036	.0200	.0000	.20	3.6	....	hh
1992	1904 May 27	Slight	Slight	Dec. vg.	0.25	5.20	2.60	.0008	.0042	.0000	.0000	.10	1.8	....	..
2702	1905 Feb. 14	None	V. slight	None	0.10	5.7	4.7	.0000	.0000	.0200	.0000	.08	1.9	....	..
3205	Sept. 28	V. slight	S. fine	M. veg.	0.30	6.0	3.7	.0014	.0144	.0100	.0000	.05	2.0	....	..
3301	Nov. 20	V. slight	Slight	M. veg.	0.30	6.6	4.0	.0044	.0164	.0100	.0000	.20	2.4	....	‡
3302	Nov. 20	None	V. slight	S. earthy	0.20	5.5	3.5	.0010	.0048	.0150	.0000	.07	2.0	....	†
3443	1906 Feb. 6	None	V. slight	None	0.10	5.5	2.5	.0006	.0034	.0100	.0000	.07	2.3	....	..
3974	Sept. 12	None	V. slight	S. veg.	0.05	9.0	4.5	.0010	.0028	.0100	.0000	.05	1.9	....	..
4490	1907 Apr. 30	V. sl. op.	V. slight	Sealing wax	0.00	3.1	2.2	.0006	.0004	.0050	.0000	.13	2.7	....	..
5509	1908 Aug. 13	None	None	None	0.00	4.1	2.3	.0004	.0000	.0050	.0000	.08	0.4	....	..
5954	1909 Jan. 27	None	None	None	0.00	4.0	2.5	.0001	.0001	.0700	.0000	.12	1.2	....	..
7540	Dec. 6	None	None	Con. earthy	0.10	4.3	3.0	.0008	.0020	.0100	.0000	.08	1.5	....	..

\* Sample taken from faucet in mill; † sample taken from Reservoir No. 1; ‡ sample taken from Reservoir No. 2; h sample taken from faucet in drug store; k stream to Reservoir No. 2; hh stream to Reservoir No. 1.

**Portsmouth.**—The city constructed a system of water works in 1891, the source being wells and springs. The watershed is about four square miles in area, partly wooded; no inhabitants very near. The wells are driven from 70 to 100 feet, in gravel. The water is pumped to a standpipe having a capacity of 500,000 gallons. There are very few private wells.

*Examination of Water from Portsmouth Water Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
621	1902 June 27	None	Sl. floe.	S. arom.	0.0	10.40	8.8	.0000	.0018	.0150	.0000	.27	4.5	....
1405	1903 Aug. 4	None	Slight	None	0.0	16.50	11.1	.0000	.0010	.0500	.0003	.57	8.7	....
2774	1905 Feb. 24	Slight	Slight	Peculiar	0.10	39.7	33.5	.0094	.0044	.2000	.0066	6.12	12.5	.... *a
2781	Mar. 29	V. mark.	M. floe.	Dec. veg.	0.60	5.7	2.6	.0000	.0082	.0150	.0000	.32	0.9	.... b
2881	1906 June 2	None	None	None	0.10	18.0	13.7	.0014	.0014	.2000	.0010	.70	10.3	.... c
2992	July 18	None	None	None	0.10	24.2	20.2	.0000	.0020	.0200	.0000	5.70	8.2	.... d
3019	July 26	S. op.	Slight	.....	.....	.....	.....	.0032	.0032	.1200	.0020	6.40	.....	.... d
3045	Aug. 3	None	S. veg.	Veg.	0.55	12.5	9.0	.0010	.0112	.0500	.0000	.54	5.4	.... e
4527	1907 May 13	None	V. slight	None	0.05	15.0	12.5	.0010	.0006	.0200	.0000	.58	7.1	....
5058	Dec. 4	None	None	None	0.05	13.9	11.5	.0004	.0010	.0040	.0000	.50	6.7	....
6002	1909 Feb. 23	None	None	None	0.00	15.3	9.4	.0004	.0004	.1500	.0000	.54	6.9	....
7690	1910 Mar. 8	None	None	None	0.00	16.9	10.8	.0002	.0022	.0100	.0000	.66	8.0	....

\* B. Coli present; a Madison Street reservoir; b reservoir Peverly Springs; c fountain head newly driven well; d Hanover Street reservoir; e Peverly Spring Brook.

*Examination of Water from Well of John Yarwood, Used by Public.*

8254	1910 Aug. 2	V. slight	Sl. earthy	Foreign	0.00	.....	.....	.0002	.0004	.0050	.0000	1.11	7.0	....
------	----------------	-----------	------------	---------	------	-------	-------	-------	-------	-------	-------	------	-----	------

*Examination of Water from Well of H. P. Paine, Used by Public.*

7983	1910 June 21	Mod. op.	Con. ferrug	Mark. earthy	0.30	.....	.....	.0010	High	.0250	.0000	.85	4.9	....
------	-----------------	----------	-------------	--------------	------	-------	-------	-------	------	-------	-------	-----	-----	------

**Raymond.**—In 1893 the town installed a public water supply from a system of wells driven from 40 to 60 feet deep, through loam, sand and gravel. The water is pumped to a standpipe having a capacity of 118,037 gallons. The watershed is about one square mile in area, is about equally wooded and cleared, and on it are about 600 inhabitants. There are a few wells in the locality.

*Examination of Water from Faucet of Raymond Water Works.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
376	1902 Jan. 24	None	None	V. slight	0.0	11.90	8.50	.0010	.0064	.1900	.0000	1.62	4.2	....
1404	1903 Aug. 4	Slight	V.S.fine	Slight	0.0	18.10	11.9	.0030	.0020	.2900	.0002	2.15	6.0	....
2018	1904 June 6	None	None	None	0.05	19.10	14.2	.0010	.0020	.4000	.0000	2.65	7.7	....
2695	1905 Feb. 14	None	None	Slight	0.0	14.2	10.8	.0000	.0000	.3000	.0000	2.50	4.1	....
3195	1905 Sept. 25	Slight	S.ferrug.	Slight	0.08	15.9	10.1	.0006	.0030	.2000	.0000	1.95	4.6	....
3441	1906 Feb. 5	None	None	Slight	0.05	14.5	11.8	.0006	.0034	.0500	.0000	2.21	4.6	....
4521	1907 May 10	None	V. slight	None	0.00	15.7	10.7	.0014	.0006	.0300	Tr.	2.30	4.8	....
5058	1907 Dec. 4	None	S. ferrug.	None	0.00	16.7	12.8	.0004	.0014	.4000	.0000	2.18	6.0	....
6015	1909 Mar. 4	None	None	None	0.05	15.8	9.7	.0001	.0005	.3500	.0000	2.5	4.9	....
7694	1910 Mar. 8	None	None	None	0.00	11.7	9.8	.0030	.0002	.0400	.0030	2.31	6.0	....

**Rochester.**—The Rochester Water Works, owned by the city, installed in 1885, has for a source a pond and reservoir, the pond being about one hundred acres, and the reservoir two hundred acres in area. The watershed, several square miles in extent, is both wooded and cleared, with, perhaps, 75 inhabitants.

*Examination of Water from Tap of City Supply, Rochester.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
878	1902 Oct. 17	None	None	S. veg.	0.15	5.70	1.00	.0000	.0086	.0000	.0000	.15	0.9	....
1436	1903 Aug. 13	V. mark.	Much fine veg.	Peculiar veg.	0.35	7.00	2.10	.0036	.0560	.0000	.0000	.20	0.4	....
2020	1904 June 6	Slight	Con. fine	Dec. misty veg.	0.2	3.10	2.20	.0020	.0198	.0000	.0000	.15	....	....
2700	1905 Feb. 15	None	None	V. slight	0.3	3.5	2.0	.0140	.0088	.0300	.0000	.22	0.4	....
3446	1906 Feb. 6	None	None	V. slight	0.10	2.7	1.1	.0006	.0064	.0050	.0000	.17	0.3	....
4558	1907 May 22	V. slight	S. flocc.	Slight	0.50	....	....	.0012	.0120	.0100	.0000	.25	0.4	....
4974	Oct. 22	None	S. mod. coarse	None	0.05	2.1	.9	.0014	.0088	.0030	.0000	.19	0.4	....
5062	Dec. 4	None	None	S. veg.	0.10	....	....	.0006	.0078	.0060	.0000	.26	1.2	....
5346	Aug. 26	Slight	V. S. coarse	Foreign	0.10	3.3	1.2	.0010	.0066	.0030	.0000	.15	0.4	....
5547	Aug. 26	Slight	Slight	None	0.10	2.5	1.2	.0012	.0060	.0020	.0000	.20	0.4	....
5898	1908 Dec. 22	V. slight	V. slight	Musty	0.60	4.3	2.6	.0020	.0180	.0000	.0000	.22	1.1	....
7227	1909 July 29	None	None	Pec.	0.20	1.9	1.0	.0015	.0065	.0000	.0000	.05	.3	....
7699	1910 Mar. 9	Slight	Slight	Foreign	0.40	4.0	1.4	.0002	.0044	.0050	.0000	.29	.7	....
8288	Aug. 8	None	V. slight	None	0.15	2.5	1.0	.0020	.0080	.0025	.0000	.18	.4	....
7814	Apr. 20	Slight	Mod.	Swampy	.50	5.4	2.8	.0040	.0065	.0035	.0000	.27	.4	.... *

\* B. Coli present.

**Salem.**—A private water supply was installed in 1903 by the Salem Water Works Company. The source of supply, Canobie Lake, is of about 1,000 acres in area, 40 feet in depth on an average, and gravelly bottom. The watershed is approximately 500 acres, mostly wooded. The shore of the pond, upon which is Canobie Lake Park, is frequented by summer cottagers and excursionists. The water flows by gravity through about three miles and a half of iron main pipe, and the service pipes are of galvanized iron. It is estimated that 15 per cent. of the population use this water.

*Examination of Water Taken from Canobie Lake.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
228	1901 Oct. 27	None	Slight	Dec.veg	0.1	2.80	1.50	.0000	.0176	.0000	.0000	.21	1.2	....
229	Oct. 27	None	Slight	Dec.veg	0.1	3.00	1.20	.0000	.0192	.0000	.0000	.23	1.2	....
45	1904 June 13	Slight	Slight	Marked veg.	0.05	6.20	2.80	.0014	.0136	.0000	.0000	.30	2.6	....
2706	1905 Feb. 20	None	S. flocc.	Dec.veg	0.00	3.7	1.1	.0010	.0060	.0800	.0000	.30	0.6	....
3203	Sept. 28	None	None	S. foul	0.10	3.7	1.7	.0008	.0080	.0050	.0000	.37	1.1	....
3832	1906 Aug. 8	None	None	None	0.10	4.2	2.7	.0014	.0082	.0050	.0000	.35	0.6	....
4818	1907 Aug. 21	None	None	None	0.05	.....	.....	.0012	.0074	.0050	.0000	.38	1.2	....
6077	1909 Apr. 8	None	None	Mr'shy	0.05	2.8	1.5	.0030	.0070	.0050	.0000	.30	.3	....

*Examination of Water from Well Supplying Schoolhouse.*

7882	1910 May 12	None	None	None	0.05	.....	.....	.0010	.0017	.0025	.0000	.40	1.5	....
------	----------------	------	------	------	------	-------	-------	-------	-------	-------	-------	-----	-----	------

**Salisbury.**—



**Sanbornton.**—No public supply.

*Examination of Water from Well of Second Baptist Church.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
5768	1908 Oct. 17	V. slight	Sl. veg.	Foreign	0.00	.....	.....	.0020	.0025	.0300	.0000	.80	1.8	.....	..
7315	1909 Aug. 26	.....	.....	Sl. foul	0.00	.....	.....	Very high	.0045	.0400	.0000	1.45	2.60	.....	*

\* B. Coli present.

**Sandown.**—

*Examination of Water from Well Owned by Boston & Maine Railroad.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
7090	1909 June 9	V. slight	V. slight	Con. earthy	0.05	.....	.....	.0020	.0035	.0200	.0000	.30	1.2	trace	..

**Somersworth.**—A system of water works was constructed in 1905-06. The water is taken from Salmon Falls River directly to a filter-bed of modern construction (Lawrence type) and capable of filtering about 1,500,000 gallons in 24 hours. The water is pumped from the storage channels of the filter-bed to a standpipe of ample capacity, from which it is distributed about the city.

*Examination of Water Supplying Somersworth.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
3463	1906 Feb. 13	None	V. slight	Slight	0.40	5.0	3.0	.0006	.0014	.0050	.0000	.20	1.6	...
4239	Dec. 20	None	V. slight	Sl. veg.	0.25	6.0	3.8	.0010	.0080	.0000	.0000	.35	2.5	...
4263	1907 Jan. 2	V. slight	V. slight	Earthy	0.20	.....	.....	.0014	.0050	.0000	.0000	.23	2.6	...
4283	Jan. 15	None	None	Earthy	0.50	.....	.....	.0014	.0080	.0000	.0000	.20	3.9	...
4340	Feb. 11	None	None	Mark'd woody	0.35	.....	.....	.0016	.0046	.0030	.0000	.25	2.2	...
4402	Apr. 4	None	None	Veg.	0.50	4.9	2.5	.0010	.0082	.0000	.0000	.22	1.2	...
4817	Aug. 19	None	Son. floe.	None	0.25	6.0	4.0	.0050	.0044	.0050	.0000	.38	2.5	...
4962	Oct. 18	Mod. op.	Con. floe fibr.	Earthy	0.70	6.2	4.6	.0024	.0136	.0020	.0000	.28	1.2	...
4963	Oct. 18	Sl. op.	Sl. mod. coarse	Sl. grass	0.70	5.0	3.0	.0050	.0124	.0020	.0000	.26	1.9	...
5060	Dec. 4	None	V. slight	Sl. veg.	0.60	4.7	2.2	.0040	.0084	.0050	.0000	.11	1.6	...
5256	1908 Apr. 27	Slight	Mod. floe	Earthy	0.40	4.5	1.2	.0026	.0130	.0080	.0000	.22	1.5	...
5257	Apr. 27	None	Slight	Sl. stale	0.30	3.4	1.2	.0010	.0066	.0100	.0000	.18	0.7	...
5830	Nov. 9	None	V. slight	Earthy	0.20	4.8	2.2	.0015	.0040	.0100	.0000	.22	1.4	...
5864	Nov. 25	None	None	None	0.20	4.3	2.2	.0002	.0075	.0000	.0000	.25	1.3	...
6000	1909 Feb. 24	None	None	M'shy	0.30	4.5	1.9	.0020	.0040	.0200	.0000	.18	1.6	...
7518	Nov. 18	None	None	None	0.30	4.0	1.7	.0002	.0070	.0050	.0000	.20	1.6	...
7708	1910 Mar. 9	V. slight	None	Earthy	0.40	3.8	2.0	.0004	.0034	.0100	.0000	.27	1.1	...
8000	June 29	V. slight	Slight	None	0.60	4.0	2.5	.0010	.0070	.0050	.0000	.25	1.9	...

\* B. Coli present; <sup>1</sup> Salmon Falls River at North Rochester; <sup>2</sup> Salmon Falls River at inlet of filter; <sup>3</sup> Salmon Falls River at Milton.

*Examination of Water from Well of Great Falls Manufacturing Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
7902	1910 May 19	None	None	Sl. earthy	0.00	22.3	19.8	.0010	.0015	.250	.0016	5.2	11.0	....	*

\* B. Coli present.

*Examination of Water from Well of Benjamin Ward.*

7621	1910 Jan. 27	Slight	Slight	Earthy	0.05	.....	.....	.0085	.0045	High	.0008	9.20	7.0	.....	..
------	-----------------	--------	--------	--------	------	-------	-------	-------	-------	------	-------	------	-----	-------	----

**Stark.—***Examination of Water from Pond Supplying Percy Summer Club.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
7286	1909 Aug. 17	None	Mod.veg.	None	0.10	.....	.....	.0001	.0025	.0050	.0000	.05	0.9	....	*

\* B. Coli present.

**Stratford.**—The village of North Stratford has two private water supplies. In 1882 Mr. Clark Stevens installed a supply from a system of springs, the watershed being about sixty acres, mostly cleared land; no inhabitants. The springs are seven in number, stoned from five to seven feet deep. In 1888 Mr. J. C. Hutchins introduced a second supply, also from springs stoned about six feet deep, with same kind of soil as first supply. The watershed is about five square miles in area, mostly cleared land, no inhabitants. The water is distributed, by gravity, through three miles of galvanized iron pipe, both service and mains. Sixty families, 95 per cent. of the population, take this water.

*Examination of Water from Hutchins Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites			
800	1902 Sept. 11	None	None	None	0.0	5.60	2.20	.0010	.0030	.0150	.0000	.05	1.9	....
3262	1905 Oct. 27	None	V. slight	V. slight	0.30	7.5	3.9	.0014	.0048	.0100	.0000	.05	1.9	....
3513	1906 Mar. 9	None	None	None	0.05	4.0	2.3	.0008	.0016	.0100	.0000	.12	1.8	....
4240	1906 Dec. 20	None	V. slight	None	0.15	7.0	4.0	.0006	.0040	.0050	.0000	.05	1.8	....
5085	1907 Dec. 18	None	V. slight	None	0.00	3.1	2.5	.0006	.0002	.0060	.0000	.12	1.9	....
5739	1908 Oct. 8	None	Slight	None	0.15	2.6	1.9	.0014	.0036	.0030	.0000	.05	1.9	.... *
6007	1909 Mar. 1	None	V. slight	None	0.05	3.7	2.5	.0002	.0008	.0300	.0000	.05	1.6	....
7714	1910 Mar. 10	None	V. slight	None	0.00	3.7	3.0	.0002	.0004	.0100	.0000	.10	2.7	....

\* B. Coli present.

*Examination of Water from Stevens Supply.*

801	1902 Sept. 13	None	None	None	0.0	6.10	2.10	.0000	.0000	.0200	.0000	.05	2.0	....
3261	1905 Oct. 27	None	None	None	0.10	7.3	3.8	.0010	.0042	.0300	.0000	.05	2.4	....
3514	1906 Mar. 9	None	None	S. fishy	0.05	7.2	3.6	.0008	.0016	.0100	.0000	.05	2.7	....
4241	1906 Dec. 20	None	None	None	0.00	8.7	7.0	.0008	.0014	.0050	.0000	.05	3.2	.... *
4332	1907 Feb. 5	None	None	None	0.00	.....	.....	.0010	.0000	.0200	.0000	.06	2.4	....
4602	1907 May 30	None	None	None	0.00	5.7	3.0	.0008	.0004	.0050	.0000	.14	1.9	.... *

\* B. Coli present.

**Sunapee.**—The Sunapee Water Works, owned by the town, were built in 1900, Sunapee Lake being the source from which water is taken to supply the Sunapee Village and Ledge Pond for George's Mills. Water from the pond flows by gravity, while that from the lake is pumped to a reservoir of 300,000 gallons' capacity. There are about five miles of distributing mains of cast iron and galvanized iron pipes. About one hundred and twenty-five families, some 80 per cent. of the population, are using this supply. The Lake Sunapee Water Supply

Company, a private company of 23 stock owners and takers, installed its works in October, 1886. The water is taken from Sunapee Lake, and flows by gravity. The plant is nearly worthless at this time, as the pipes are of small size and filled with rust.

*Examination of Water from Lake Sunapee and from Ledge Pond.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
823	1902 Sept. 22	None	Slight	S. musty	0.1	3.50	.60	.0000	.0112	.0000	.0000	.07	0.6	.... <i>a</i>
824	Sept. 22	None	V. slight	Dec. veg.	0.15	3.40	.70	.0000	.0090	.0000	.0000	.10	0.6	.... ..
1418	1903 Aug. 10	V. slight	V. slight	V. dec. veg.	0.1	3.60	2.80	.0000	.0080	.0400	.0000	.07	2.8	.... ..
1419	Aug. 10	None	V. slight	Dec. veg.	0.05	3.50	0.90	.0000	.0122	.0000	.0000	.05	0.9	.... ..
2019	1904 June 6	None	V. slight	S. foul	0.2	3.50	2.10	.0012	.0052	.0000	.0000	.10	2.0	.... ..
2713	1905 Feb. 21	V. slight	Slight	Slight	0.10	3.6	1.9	.0000	.0014	.0900	.0000	.10	0.6	.... ..
3237	Oct. 17	None	None	S. veg.	0.10	4.0	1.4	.0010	.0058	.0050	.0000	.05	0.9	.... ..
3468	1906 Feb. 19	None	None	None	0.00	3.5	2.0	.0010	.0038	.0050	.0000	.10	0.7	.... ..
3471	Feb. 21	None	None	S. veg.	0.10	3.0	2.0	.0010	.0038	.0100	.0000	.10	0.9	.... <i>a</i>
3862	Aug. 20	None	None	None	0.20	3.7	2.2	.0026	.0094	.0100	.0000	.10	0.4	.... ..
3894	Aug. 23	V. slight	V. slight	Mrk'd earthy	0.10	3.9	2.4	.0014	.0094	.0050	.0000	.10	0.4	.... <i>a</i>
4405	1907 Apr. 5	S. op.	V. slight	S. earthy	0.10	2.4	1.0	.0034	.0090	.0000	.0000	.05	1.2	.... ..
4534	May 15	None	S. coarse	S. veg.	0.15	3.0	1.2	.0030	.0082	.0120	.0000	.12	1.2	.... ..
5074	Dec. 12	None	None	None	0.10	2.3	1.2	.0008	.0078	.0040	.0000	.08	0.4	.... ..
5077	Dec. 13	None	None	None	0.20	4.0	2.0	.0014	.0096	.0100	.0000	.12	0.4	.... <i>a</i>
5396	1908 July 2	V. slight	S. floe.	Mrk'd earthy	0.20	.....	.....	.0002	.0036	.0070	.0000	.10	0.4	.... ..
7693	1910 Mar. 8	None	None	None	0.05	3.2	1.2	.0006	.0032	.0050	.0000	.13	.7	.... ..
7704	Mar. 9	None	None	Sl. swampy	0.20	3.6	1.8	.0006	.0105	.0050	.0000	.11	1.1	.... ..

*a* Ledge Pond, George's Mills Supply.

*Examination of Water from Well of Emerson Paper Company.*

8005	1910 June 30	V. slight	V. slight	Veg.	0.05	.....	.....	.0025	.0010	.0250	.0016	.15	5.3	.... ..
------	--------------	-----------	-----------	------	------	-------	-------	-------	-------	-------	-------	-----	-----	---------



**Sutton.**—One well, owned by the town, furnishes water through a lead pipe, some 500 or 600 feet, to a trough, one end for horses, and from the other several families get their drinking-water.

*Examination of Water from Well of M. B. Wadleigh.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
7654	1910 Feb. 8	None	None	None	0.00	.....	.....	.0010	.0012	.4000	.0000	.80	2.60	.01	*

\*B. Coli present.

**Swansey.**—

*Examination of Water from Wells Supplying Y. M. C. A. Camp.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
8331	1910 Aug. 17	Sl. op.	V. s. coarse	Earthy	0.05	.....	.....	.0010	.0010	.0050	.0000	.15	2.6	....	<i>a</i>
8332	Aug. 17	None	S. floe.	None	0.05	.....	.....	.0010	.0010	.0050	.0000	.10	1.2	....	<i>b</i>

*a* East well; *b* west well.

**Tamworth.**—

*Examination of Water from Well of Congregational Society.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
5713	1908 Oct. 1	None	None	None	0.05	.....	.....	.0010	.0020	.3500	.0010	1.90	....	....	..

*Examination of Water from the Well Supplying Chocorua House  
Syndicate.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
7921	1910 May 24	None	None	S. earthy	0.00	2.1	1.3	.0015	.0020	.0050	.0000	.25	.4	.....

**Temple.—**

*Examination of Water from Spring of William H. Davidson.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
8242	1910 July 31	None	None	V. S. earthy	0.00	.....	.....	.0004	.0004	.0040	.0000	.25	1.9	V. h'gh ..

**Tilton.**—The Tilton & Northfield Aqueduct Company's works were built in 1887-88. The source is Chestnut Pond, of 60 acres area, 10 to 76 feet deep, sandy or gravelly bottom. Several hundred acres of the watershed are pasture and woodland; five farms. This is a gravity system, with 12 miles of cement-lined and cast iron mains, with galvanized iron service pipes. Probably 500 families take this water, 80 or 90 per cent. of the population.

*Examination of Water from a Faucet of the Tilton & Northfield Aqueduct Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
11	1901 May 28	V. slight	Slight	Distinct	0.2	3.40	1.30	.0019	.0150	.0000	.0000	.09	....	....
345	Dec. 31	None	None	None	0.2	2.90	1.20	.0044	.0136	.0050	.0000	.09	0.9	....
1219	1903 June 1	Marked	Much flocc. red	V. slight	0.2	4.60	2.00	.0000	.0100	.0000	.0000	.10	1.1	....
1431	Aug. 11	Slight	None	V. slight	0.15	3.00	1.00	.0000	.0074	.0000	.0000	.09	0.4	....
1636	Nov. 2	None	None	None	0.0	2.80	1.30	.0000	.0050	.0000	.0000	.20	1.2	....
2022	1904 June 7	Slight	Much fine	V. slight	0.3	4.40	2.20	.0000	.0098	.0000	.0000	.10	1.9	....
2712	1905 Feb. 21	Slight	V. slight	Slight	0.10	3.9	2.5	.0000	.0010	.0150	.0000	.15	0.6	....
2785	Apr. 3	None	None	Dec.veg	0.30	8.5	6.5	.0000	.0044	.0100	.0000	.15	0.6	....
3482	1906 Feb. 22	V. slight	None	Sl. earthy	0.20	2.0	1.0	.0010	.0084	.0050	.0000	.17	0.9	....
4533	1907 May 14	V. slight	S. veg.	S. veg.	0.30	3.5	2.0	.0054	.0166	.0050	.0000	.25	1.2	....
5082	Dec. 16	Slight	V. slight	None	0.20	3.2	1.7	.0012	.0042	.0100	.0000	.23	0.4	....
5873	1908 Dec. 1	None	V. slight	Earthy	0.10	1.9	....	.0001	.0120	.0500	.0000	.12	.10	....
5861	Nov. 25	V. slight	V. slight	Sl. earthy	0.10	1.5	0.4	.0010	.0080	.0000	.0001	.13	.10	....
7688	1910 Mar. 8	None	None	Earthy	0.05	1.9	0.6	.0024	.0050	.0050	.0000	.11	.40	....

*Examination of Melted Ice from Ice Supply of Frank Sanborn.*

7922	1910 May 26	Mod.fibr.	Con. fibr.	Arom.	0.05	.....	.....	.0010	.0110	.0025	.0000	.05	.0	.....
------	-------------	-----------	------------	-------	------	-------	-------	-------	-------	-------	-------	-----	----	-------

*Examination of Melted Ice from Ice Supply of A. A. Cunningham.*

7923	1910 May 26	S op.	Mod.gel.	Arom.	0.05	.....	.....	.0070	.0105	.0025	.0000	.05	.0	.... *
------	-------------	-------	----------	-------	------	-------	-------	-------	-------	-------	-------	-----	----	--------

\* B. Coli present.

**Walpole.**—The Walpole Water & Sewer Company inaugurated a system of water works in 1904. It consists of a reservoir having an area of about two acres and an average depth of about 10 feet, constructed on a small stream. The site was stripped to a gravel and hard dirt bottom. The watershed is about six tenths of a square mile, wooded and cleared. Two families at a considerable distance from brook.

The force is gravity, four miles of coated cast iron mains, with galvanized iron service pipes, being used. Eighty families, 50 per cent. of the population of Walpole Village, have this supply. There are many private wells within the area.

The water from the reservoir above referred to flows through a filter plant; thence into a distributing reservoir of concrete construction, covered on top, of about 50 feet diameter, 18 feet deep; capacity about 250,000 gallons.

The village of North Walpole also has a supply derived from springs.

*Examination of Water from the Company's Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites			
2082	1904 June 20	None	S. flocc.	S. musty	0.1	7.30	4.60	.0048	.0032	.0200	.0000	.15	4.1	....
2119	July 3	Slight	Slight	S. veg.	0.1	5.50	3.90	.0052	.0038	.0000	.0000	.15	3.2	.... *
2591	Dec. 13	None	Slight	M. foul	1.5	6.3	4.0	.0000	.0034	.0000	.0001	.20	3.2	....
2779	1905 Mar. 26	None	Slight	Dec. veg.	0.2	5.3	3.5	.0000	.0030	.0150	.0000	.10	1.9	....
2994	July 18	V. slight	Much	Dec. veg.	0.8	7.7	4.4	.0024	.0142	.0050	.0000	.07	3.1	....
3476	1906 Feb. 19	None	None	None	0.0	5.8	3.8	.0014	.0014	.0050	.0000	.12	2.4	.... *
3640	May 30	None	Slight	None	0.05	2.0	1.0	.0010	.0040	.0100	.0000	.15	....	....
3641	May 30	None	None	Slight	0.10	4.5	3.0	.0010	.0014	.0050	.0000	.25	1.6	....
4342	1907 May 17	None	V. slight	Veg.	0.15	5.8	3.1	.0002	.0020	.0050	.0000	.15	2.5	....
5080	Dec. 16	None	None	None	0.10	4.6	3.8	.0014	.0010	.0050	.0000	.30	2.6	.... *
5552	1908 Aug. 24	V. slight	V. slight	None	0.05	....	....	.0034	.0024	.0150	.0000	.18	2.4	....
7702	1910 Mar. 9	None	None	None	0.05	4.1	2.8	.0004	.0014	.0050	.0000	.14	2.6	....

\* B. Coli present.

*Examination of Water from Supply of North Walpole.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
5618	1908 Sept. 12	None	V. slight	Foreign	0.00	4.6	3.7	.0016	.0016	.0100	.0000	.24	1.8	....	*
5619	Sept. 12	None	V. slight	Foreign	0.00	4.9	3.8	.0024	.0040	.0060	.0000	.25	2.4	....	*
5663	Sept. 21	None	None	None	0.00	7.5	3.2	.0002	.0032	.0080	.0000	.33	2.6	....	..
5664	Sept. 21	V. faint	V. slight	None	0.00	9.4	5.2	.0008	.0002	.0020	.0000	.31	2.6	....	..
5665	Sept. 21	None	None	None	0.00	.....	.....	.0002	.0002	.0020	.0000	.27	2.2	....	..

\* B. Coli present.

*Examination of Water from Town Well.*

5551	1908 Aug. 21	None	V. slight	None	0.00	17.3	13.7	.0004	.0018	.2200	.0000	2.11	5.0	....	..
7975	1910 June 18	None	V. slight	S. foul	0.00	8.0	3.8	.0020	.0010	.1000	.0000	1.10	3.5	....	..

*Examination of Water from Supply Owned by C. H. Holden.*

5756	1908 Oct. 14	None	None	None	0.00	15.8	....	.0030	.0024	1.000	.0004	1.70	5.9	....	*
------	-----------------	------	------	------	------	------	------	-------	-------	-------	-------	------	-----	------	---

\* B. Coli present.

**Warner.**—In 1895 a supply was introduced by private parties, which was later purchased by the Warner Village Fire District. This consists of a reservoir supplied by springs and a brook. The bottom is clayey hardpan in part, and part gravel; average depth, eight feet. Cast iron and galvanized iron pipe is used. The watershed is estimated at 400 acres, wooded; not more than 12 inhabitants. The volume of water varies greatly. The water flows by gravity. There are quite a number of private wells in the locality. There are many private supplies which are piped from springs long distances through lead pipe.



*Examination of Water from a Faucet of the Village District Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
754	1902 Aug. 29	None	None	V. slight	0.3	5.30	2.00	.0000	.0110	.0000	.0000	.10	1.5	....
1417	1903 Aug. 10	Slight	Fine	Foul veg.	0.1	4.20	1.60	.0000	.0106	.0000	.0000	.08	1.6	....
2122	1904 July 6	Slight	S. fine	S. veg.	0.25	5.60	2.10	.0000	.0050	.0000	.0000	.10	1.2	....
2715	1905 Feb. 22	None	None	V. slight	0.10	5.3	3.2	.0000	.0010	.0000	.0000	.12	1.2	....
3470	1906 Feb. 19	None	None	None	0.05	2.5	1.8	.0010	.0020	.0100	.0000	.15	1.1	....
4133	1906 Nov. 7	None	None	Slight	0.35	5.2	3.0	.0014	.0100	.0100	.0000	.10	1.8	....
4555	1907 May 22	None	S. flocc.	Veg.	0.10	2.3	1.8	.0004	.0046	.0100	.0000	.10	0.7	....
5079	1907 Dec. 17	None	None	None	0.20	2.2	1.6	.0012	.0024	.0070	.0000	.15	0.4	....
5625	1908 Sept. 12	V. slight	V. slight	Stale	0.10	.....	.....	.0002	.0070	.0020	.0000	.06	1.2	.... *a
5641	1908 Sept. 16	Mod. flocc.	Earthy	None	?	6.8	3.3	.0002	.0010	.0150	.0000	.35	2.9	.... *b
7705	1910 Mar. 10	None	None	None	0.10	5.4	1.8	.0030	.0026	.0050	.0000	.18	.40	....

\* B. Coli present; a auxiliary supply from Warner River; b new well 50 feet from the river.

*Examination of Water from Well Owned by Boston & Maine Railroad.*

7515	1909 Nov. 23	Heavy	V. S. earthy	V. mk'd earthy	Hgh	.....	.....	.0002	.0170	.0050	.0000	.10	1.9	....
------	--------------	-------	--------------	----------------	-----	-------	-------	-------	-------	-------	-------	-----	-----	------

**Warren.**—There are two private systems of water works in town: one, the Warren Water Works, was built in 1873, the source being a spring about a mile distant. The water flows by gravity through galvanized iron pipe. Nineteen families are supplied from this source. The other supply, the H. N. Merrill Water Works, was installed about the year 1895. This supply is from a spring and driven well 474 feet deep. The water flows partly by gravity and partly by being pumped into a reservoir. Ten per cent. of the population, 24 families, take this water, which is delivered through one mile of iron main and galvanized iron service pipes. Several families have private supplies, pipes from

springs on elevated ground. There are not many private wells within the radius of these supplies.

*Examination of Water from Various Sources.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
875	1902 Oct. 17	Slight	Fine	V. slight	0.1	7.20	2.60	.0000	.0116	.0000	.0500	.09	1.95	....	<i>a</i>
877	Oct. 17	None	None	S. veg.	0.1	6.50	2.70	.0000	.0038	.0000	.0000	.10	2.7	....	<i>b</i>
3227	1905 Oct. 10	None	None	None	0.05	5.4	2.1	.0020	.0020	.0100	.0000	.12	1.1	....	<i>b</i>
3472	1906 Feb. 22	None	None	None	0.0	8.5	7.5	.0040	.0010	.0100	.0000	.10	4.6	....	<i>ac</i>
3473	Feb. 22	V. slight	V. slight	None	0.0	2.9	2.3	.0030	.0024	.0100	.0000	.10	1.4	....	<i>ad</i>
4543	1907 May 18	None	None	Sl. veg.	0.00	4.6	3.4	.0004	.0006	.0700	.0000	.05	2.5	....	<i>a</i>
5075	Dec. 13	None	None	None	0.5	.....	.....	.0008	.0024	.0040	.0000	.15	1.2	....	<i>a</i>
7730	1910 Mar. 17	None	V. slight	None	0.00	4.0	2.6	.0016	.0012	.0060	.0000	.03	2.4	h'gh	<i>a</i>
8280	Aug. 8	None	None	None	0.00	4.4	3.5	.0010	.0005	.0450	.0000	.05	2.6	.0	<i>a</i>

*a* From H. N. Merrill Water Works; *b* from Warren Water Works; *c* from well; *d* from spring.

*Chemical Examination of Water from Stream, Supply of State Sanitarium for Consumptives.*

4780	1907 Aug. 3	None	S. flocc.	None	0.10	3.1	0.8	.0010	.0030	.0050	.0000	.13	0.4	....	..
7355	1909 Sept. 11	None	None	None	0.00	4.0	2.2	.0002	.0002	.0050	.0000	.05	0.7	....	..

*Examination of Melted Ice Taken from Pond.*

8339	1910 Aug. 14	Slight	Mod. grey flocc.	Earthy	0.00	.....	.....	High	High	.1250	.0000	.01	.0	....	*
------	-----------------	--------	------------------	--------	------	-------	-------	------	------	-------	-------	-----	----	------	---

\* *B. Coli* present.

**Weare.**—No public supply.

*Examination of Water from Wells Owned by B. & C. D. Fessenden Company, East Weare.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
8315	1910 Aug. 15	None	None	None	0.00	.....	.....	.0010	.0010	.0025	.0000	.10	1.2	.....
8316	Aug. 15	None	V. slight	None	0.00	.....	.....	.0020	.0020	.2500	ft. tr.	.50	3.9	.....
8317	Aug. 15	None	None	Foul	0.00	.....	.....	.0010	.0020	.0750	.0000	.30	4.6	.0 ..

**Westmoreland.**—

*Examination of Water from Well of John P. Kuhlke.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
7677	1910 May 9	None	Slight	S. earthy	0.05	.....	.....	.0025	.0035	.0100	.0000	.20	1.2	.....

**Whitefield.**—The public water works, owned by the town, were built by private parties in 1892. There are two watersheds of about 30 acres each. The water flows by gravity to a reservoir having a capacity of about 1,000,000 gallons, and is delivered through five miles of cast iron mains, galvanized iron service pipes, to about 300 families, seven eighths of the entire population. (See special report elsewhere).

*Examination of Water from Town Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
861	1902 Oct. 14	None	Sl. flocc.	Veg.	0.0	5.00	1.50	.0000	.0026	.0000	.0000	.04	1.5	.... ..
2143	1903 July 11	None	None	S. veg.	0.1	6.60	2.60	.0050	.0034	.0000	.0000	.05	1.4	.... ..
2429	Aug. 11	None	None	V. slight	0.0	4.40	2.40	.0022	.0058	.0000	.0000	.07	1.6	.... ..
2718	1905 Feb. 23	None	None	None	0.0	4.4	3.0	.0000	.0014	.0300	.0000	.10	1.5	.... ..
3133	Oct. 17	None	None	None	0.15	3.9	2.9	.0008	.0048	.0100	.0000	.05	0.6	.... ..
3484	1906 Feb. 17	None	None	None	0.10	4.8	3.0	.0010	.0052	.0200	.0000	.05	0.9	.... ..
7700	1910 Mar. 9	Sl. op.	S. earthy	None	0.10	6.4	2.5	.0002	.0020	.0050	.0000	.10	0.3	.... ..
8255	Aug. 2	None	V. slight	Foreign	0.05	4.0	3.4	.0006	.0042	.0100	.0000	.03	0.9	.... *

\* B. Coli present.

**Wilmot.—***Examination of Water from Well of Kearsarge School of Practice.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
7018	1909 Apr. 30	None	None	None	0.00	.....	.....	.0015	.0030	.0050	.0000	.05	0.4	.075 ..
7563	Feb. 22	None	None	Sl. earthy	0.00	5.0	....	.0002	.0002	.0200	.0000	.05	1.9	.04 ..

*Examination of Water from Well of the Congregational Society.*

7729	1910 Mar. 17	None	V. slight	None	0.00	6.4	2.2	.0014	.0034	.1300	.0000	1.70	2.6	High ..
7916	May 24	None	None	None	0.05	.....	....	.0015	.0020	.0100	.0000	.70	1.3	.012 ..

**Wilton.**—The source of the supply is Mill Brook, with the intake at Gaerwen Falls, 250 feet above the bridge at East Wilton, about 1 2-3 miles from the village. Mill Brook, or Gaerwen Falls Brook, rises on the eastern slope of the Pack Monadnock range of mountains, and has a watershed of nearly four square miles. It is also the outlet of Burton Pond, a sheet of water some 60 acres in extent which is dammed and will serve as an admirable storage reservoir. There are seven miles of 12-inch iron mains, with galvanized iron service pipes, through which the water is delivered by gravity to about 100 families.

*Examination of Water from Wilton Supply.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
1869	1904 Mar. 13	None	Sl. flocc. veg.	Mrk'd veg.	0.2	4.30	2.10	.0010	.0048	.0000	.0000	.15	1.25	....
1915	May 1	None	Flocc. veg.	S. veg.	0.3	2.80	1.20	.0014	.0082	.0000	.0000	.12	0.7	....
1982	May 23	Slight	Much veg.	Much veg.	0.35	4.80	1.20	.0000	.0076	.0000	.0000	.10	1.1	....
2124	July 5	V. slight	Slight	Sl. veg.	0.25	4.80	1.50	.0000	.0074	.0000	.0000	.15	0.7	....
2274	Aug. 14	None	V. slight	Musty veg.	0.25	4.20	1.90	.0000	.0034	.0000	.0000	.15	0.4	.... *
2363	Sept. 13	V. slight	V. slight	Dec. veg.	0.20	3.70	1.70	.0014	.0028	.0000	.0000	.20	0.9	.... *
2471	Oct. 4	Slight	Con. flocc.	Dec. veg.	0.4	5.6	2.2	.0044	.0120	.0000	.0000	.35	1.4	.... *a
3342	1905 Oct. 18	None	V. slight	Sl. earthy	0.8	5.0	2.7	.0040	.0100	.0050	.0000	.25	1.4	.... *a
3271	Oct. 30	None	None	S. veg.	0.28	3.8	1.3	.0010	.0040	.0050	.0000	.27	0.4	.... a
3483	1906 Feb. 26	S. op.	Slight	Slight	0.20	6.9	3.7	.0020	.0090	.0200	.0000	.22	1.2	.... a
4827	1907 Aug. 21	None	None	None	0.05	3.9	1.6	.0016	.0044	.0050	.0000	.22	1.2	....
5771	1908 Oct. 20	Sl. op.	None	None	0.25	3.1	2.1	.0010	.0020	.0000	.0000	.17	1.2	....
7891	1910 May 16	V. slight	None	Musk	0.40	2.9	1.5	.0010	.0085	.0025	.0000	.30	0.6	....

\* B. Coli present; a reservoir.



**Winchester.**—*Examination of Water from Spring of Water Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.	
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.				
7800	1910 May 18	Slight	Sl. earthy	V. S. earthy	0.10	4.2	3.6	.0010	.0020	.0050	.0016	.12	1.2	.025	*

\* B. Coli present.

*Examination of Water from Well of Fred Felch.*

7759	1910 Apr. 8	None	None	None	0.00	.....	.....	.0004	.0006	.0050	.0000	.26	1.5	h'gh	..
------	----------------	------	------	------	------	-------	-------	-------	-------	-------	-------	-----	-----	------	----

**Wolfeboro.**—The public water works, owned and operated by the town, were installed in 1889. The source of the supply is a pond of about 300 acres; depth in places from 60 to 70 feet; average for the pond about 32 feet; bottom mostly sand, with small rocks. The watershed is from three to four square miles in extent; five sevenths woodland, two sevenths pasture; only one family inhabits the watershed. This is a gravity system, with between five and six miles of cast iron mains and galvanized and wrought iron service pipes. Practically the entire population is supplied from this system.

*Examination of Water from Public Fountain.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
842	1902 Oct. 9	None	None	S. musty	0.0	3.90	1.40	.0000	.0068	.0000	.0000	.07	1.3	....
1659	1903 Nov. 9	Slight	Fine	S. veg.	0.0	2.90	1.40	.0010	.0056	.0000	.0000	.08	1.4	....
2136	1904 July 5	None	S. fine	V. slight	0.1	2.30	.80	.0000	.0062	.0000	.0000	.15	0.9	....
2711	1905 Feb. 21	Slight	Slight	Slight	0.00	3.6	1.8	.0000	.0014	.0500	.0000	.00	0.6	....
3234	Oct. 17	None	Slight	Veg.	0.10	2.5	2.5	.0008	.0090	.0100	.0000	.07	0.4	....
3506	1906 Mar. 6	None	None	S. veg.	0.10	3.5	1.8	.0014	.0074	.0050	.0000	.15	0.7	....
3868	Aug. 20	None	None	None	0.10	2.9	1.2	.0022	.0000	.0050	.0000	.07	0.4	....
4578	1907 May 29	None	V. slight	None	0.05	4.1	1.8	.0006	.0064	.0100	.0000	.14	0.4	....
5230	Apr. 13	None	V. slight	V. mk'd veg.	0.25	2.0	.6	.0002	.0074	.0040	.0000	.08	0.4	....
7706	1910 Mar. 9	None	V. slight	None	0.00	2.9	1.5	.0010	.0042	.0050	.0000	.13	.10	....

**Woodstock.**—In 1897 the North Woodstock Water Company installed a system of water works which was sold to the town of Woodstock. This is in the precinct of North Woodstock. The source is a stream dammed to form a reservoir of about one acre. Seventy families, 99 per cent. in the precinct, are takers. There are no wells in the precinct. The town of Woodstock is about evenly divided into the northern and southern portion. The latter is supplied with water from private wells and springs, and since the removal of all lead pipe, etc., it seems to be of good quality.

*Examination of Water from Supply of the North Woodstock Water Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
2215	1904 July 29	V. slight	V. slight	None	0.7	5.90	1.40	.0010	.0080	.0000	.0000	.05	0.7	....
3889	1906 Aug. 22	Gel.	None	Veg.	0.50	.....	.....	.0010	.0080	.0050	.0000	.05	0.4	....
4438	1907 Apr. 16	None	None	Sl. veg.	0.18	4.1	1.7	.0016	.0024	.0050	.0000	.05	0.9	....
4748	July 22	None	None	None	0.70	3.8	1.5	.0002	.0046	.0050	.0000	.15	0.4	....
5081	Dec. 16	None	None	None	0.20	2.8	2.1	.0006	.0026	.0150	.0000	.10	1.2	....
8104	1910 July 13	V. slight	None	None	0.55	2.6	0.8	.0006	.0020	.0025	.0000	.07	0.4	....

*Examination of Water from Elbow Pond, Proposed Source of Public Supply.*

6080	1909 Apr. 9	Sl. veg.	Sl. veg.	Arom.	0.3	2.8	1.4	.0025	.0090	.0100	.0000	.06	0.1	....
6081	Apr. 7	None	Sl. veg.	Arom.	0.3	3.0	1.6	.0065	.0100	.0100	.0000	.05	0.1	....

**Woodsville** (village in town of Haverhill).—Woodsville Fire District is supplied with water by the Woodsville Aqueduct Company, whose plant was installed in 1885 by James Gordon, who introduced water from Gordon Spring in 1892 or 1893. The first-named supply is from Ammonoosuc River, which receives all the sewage from the towns of Bath, Lisbon and Littleton, farther up the river. The water is pumped directly from the river, and flows through about three miles of iron distributing mains.

This company also supplies water from a spring, dug about four feet deep, which yields about 50,000 gallons daily, delivered through two miles of lead pipe. Soil is mucky loam with sandy bottom. About nine tenths of the population are supplied from these sources.

Gordon spring is about two feet deep, while the volume of water is about 48,000 gallons daily; soil, mucky loam with sandy bottom. One-half mile of galvanized iron pipe is used to convey this water. Thirty-three families take from this supply.

*Examination of Water from Supply of Woodsville Aqueduct Company.*

Number.	Date of collection.	Appearance				Residue on Evapo'n		Ammonia		Nitrogen as		Chlorine.	Hardness.	Lead.
		Turbidity.	Sediment.	Odor.	Color.	Total.	Fixed.	Free.	Albuminoid	Nitrates.	Nitrites.			
1901														
17	June 3	None	Con.floc.	S. veg.	0.1	3.60	1.20	.0014	.0057	.0066	.0000	.13	...	...
81	June 3	None	Much floc.	S. veg.	0.1	4.10	1.70	.0046	.0093	.0066	.0000	.13	...	...
19	June 3	None	Slight	S. veg.	0.1	3.70	2.20	.0004	.0057	.0066	.0000	.13	...	...
57	July 9	None	Floc.veg.	Dec.veg	0.12	5.00	2.00	.0009	.0104	.0050	.0002	.26	2.0	...
58	July 9	None	None	Veg.	0.10	4.70	2.10	.0032	.0104	.0050	.0002	.20	...	...
59	July 9	None	Much floc.veg	Dec.veg	0.12	4.70	2.20	.0032	.0135	.0050	.0002	.20	...	...
159	Sept.12	None	None	Dec.veg	0.15	5.10	3.30	.0016	.0112	.0000	.0000	.19	...	...
160	Sept.12	None	Floc.veg.	Dec.veg	0.15	5.60	2.60	.0026	.0126	.0000	.0000	.19	...	...
1902														
404	Feb. 13	None	V. slight	Veg.	0.1	5.80	3.40	.0006	.0070	.0200	.0000	.10	1.6	...
1903														
1022	Feb. 2	None	None	S. veg.	0.2	4.30	1.90	.0000	.0048	.0200	.0000	.08	1.9	...
1023	Feb. 2	None	None	None	0.0	7.30	3.10	.0000	.0014	.0200	.0000	.12	2.9	...
1430	Aug. 11	Marked	Much fine veg.	V.slight	0.15	6.60	3.40	.0010	.0074	.0000	.0000	.15	1.8	...
1749	Dec. 18	None	Slight	None	0.0	6.20	4.30	.0004	.0048	.0400	.0002	.13	2.6	...
1904														
2117	July 4	Slight	Con.floc.	M. veg.	0.2	4.10	2.30	.0108	.0082	.0000	.0000	.15	1.8	...
1905														
2723	Feb. 25	None	Con.	V.slight	0.10	5.7	4.0	.0020	.0000	.0200	.0000	.20	1.8	...
2811	Apr. 24	None	Slight	None	0.10	7.7	4.6	.0000	.0014	.0050	.0000	.10	2.6	... *a
2851	May 17	Marked	Slight	None	0.10	6.6	4.0	.0000	.0000	.0150	.0000	.10	2.6	... a
1906														
3499	Mar. 5	None	Con.	None	0.15	4.0	3.2	.0000	.0080	.0100	.0001	.05	1.5	... *
4191	Nov.28	None	V. slight	None	0.05	5.0	3.8	.0010	.0020	.1000	.0000	...	3.4	.03 a
1907														
4936	Oct. 8	None	Slight	None	0.69	5.5	3.0	.0002	.0066	.0040	.0000	.08	1.6	...
5073	Dec. 13	Slight	V. slight	S. veg.	0.50	5.0	2.8	.0010	.0110	.0100	.0000	.08	1.9	...
1910														
7697	Mar. 9	Sl. op.	Slight	Earthy	0.40	4.1	2.3	.0002	.0078	.0050	.0000	.15	1.4	...

\* B. Coli present; a Child's Brook, proposed supply.

*Examination of Water from the Supply of Mrs. James Mitchell, Peddled in Village.*

7698	1910 Mar. 9	None	V. slight	Sl. earthy	0.00	8.0	3.7	.0006	.0002	.0050	.0000	.17	2.0	....
------	----------------	------	-----------	------------	------	-----	-----	-------	-------	-------	-------	-----	-----	------

---

**SPECIAL REPORTS ON WATER SUPPLIES.**

---





## CLAREMONT'S WATER SUPPLY.

---

By ROBERT FLETCHER, PH. D., Consulting Engineer, Member American Society Civil Engineers, President and Engineer Hanover Water Works Co.

---

HANOVER, N. H., December 24, 1909.

*Messrs. H. C. Sanders, F. S. Crossman, W. E. Lawlor, Water Commissioners, Claremont, N. H.*

GENTLEMEN:—Complying with a request from Mr. James L. Rice, superintendent of the Claremont Water Works, and in accordance with the vote passed at the town meeting of November 6th in Claremont, I made an inspection of the reservoirs and contiguous territory on November 19th, and examined into the conditions affecting the quantity and quality of your water supply, and the conditions which must determine its continued sufficiency and safety.

The following report deals with

Firstly, the examination of the reservoir district.

Secondly, the present situation and outlook for the future supply.

Thirdly, recommendations.

Firstly. The examination included a view of the lower reservoir, capacity about 2,500,000 gallons, giving a pressure head above the square of 160 feet, equivalent to about 70 lbs. per square inch. This distributing reservoir, fed from the reservoirs on the other drainage lines when the storage is sufficient,—and in times of scarcity, replenished by pumping from the constructed wells on the island—is protected from the drainage of the ravine above it by a low wall of cemented rubble masonry and a conduit of 24-inch pipe which diverts the flow entirely around the reservoir. Hence the dwellings and out-houses on the ravine,—one set near the dam and two higher up,—do not threaten the purity of the water.

Even if the flow on this drainage line were beyond suspicion of pollution it is not wanted in the small reservoir because, after every storm, it would make deposits of silt and produce turbidity in all of the water served to the town. As previous investigations have shown

that there is no suitable location on the upper reaches of this ravine for a large storage reservoir, and as the cost of raising the dam of the small reservoir would be large in proportion to the extra amount of storage gained, the present arrangement seems to be well adapted to the circumstances.

The middle reservoir with a capacity of about 3,500,000 gallons is fed from the upper reservoir and the small drainage from adjacent land, and itself feeds the lower reservoir by a suitable conduit under ground. The substantial and admirable concrete spillway here provides ample discharge for all surplus water while completely protecting the dam from injury.

The upper or main storage reservoir has a capacity of about twenty-six million (26,000,000) gallons and receives the drainage of a large territory above, principally woodland, but including also considerable mowing and pasture land on the east and northeast.

The conditions about the immediate vicinity of all these reservoirs are excellent. The low stage of the two upper ones revealed clean bottoms and margins. The superintendent spoke of intention to cut out the small hard wood growth along the feeding brooks and to promote the increase of the evergreens so as to abate the nuisance from leaves. The borders of the reservoirs are or will be cleared of hard wood growth for some rods back for the same reason. The surrounding fifty acres or more, owned by the town to safeguard the upper reservoirs, are well fenced and made secure from invasion by grazing animals by means of locked bars.

A considerable part of the territory which drains into these reservoirs was traversed from south to north in two trips afoot, and a circuit made east and west near the divide and beyond. Observation was made of the nature of the land, its soil, slopes, stream lines and its adaptability for collection and storage of water.

There was no call for an examination of the pumping plant, even if time had permitted; the construction of the wells on the island, as described, being according to well-known correct methods, and the analyses of the water by the State Board of Health from time to time giving sufficient information as to the qualities of the water.

Secondly. The present situation and outlook.

It goes without saying that this valuable property of the town, evidently managed with painstaking care and efficiency by a superintendent who thoroughly understands its conditions and needs in every detail, is an asset in more than the ordinary meaning of that term. Whatever controversy there may be about other public

utilities, all are agreed that water works should be owned and operated by the community. They distribute to every man, woman and child one of the prime necessities of existence, and thus vitally affect the health, comfort and convenience of every home which they serve. In this property, more than in any other, every citizen and taxpayer should take an intelligent interest, and may properly hold toward it a sense of personal ownership. But the management must of necessity be in the hands of an expert, made such by practical acquaintance with the inexorable laws of hydraulics, the special demands of the works in every part, and the conditions of economical administration. With the growth of the community the demands upon the works must continue to increase, and the value will increase in the same degree, under wise management. But everything wears out, and a sound business policy would dictate, at the very least, the accumulation of a depreciation fund to provide for inevitable deterioration, and such replacement and improvement as ought to be foreseen. It is the cry of the demagogue that water should be as "free as air," and many people grumble when paying their water dues, as though these were a heavy tax. But no intelligent property owner will accept such doctrine and the candid man will admit that the usual water rates are really a very moderate price to pay for the benefits received; indeed, quite a small interest on such investment as he would have to make to provide for himself a water supply so good and abundant.

Your superintendent reports a probable daily consumption, during the hot, dry season, of about three quarters of a million (750,000) gallons, of which more than 330,000 gallons daily have to be pumped during September and October. Also that a little less than 100,000 gallons of the daily use is registered by meters. Evidently the ideal system must have all services metered, for only thus can waste in the houses be checked, and each consumer be made to pay according to what he uses.

These figures indicate an increasing demand which the checking of the waste may reduce to some extent, but not for a long time ahead, —while the available storage capacity scarcely exceeds (30,000,000) thirty million gallons. At the same time it is not desirable to be so much dependent upon the pumps for eking out the supply. Manifestly then the first requirement is a larger storage capacity.

Moreover, the inspection of the territory made the fact quite apparent that

Secondly, the flowage into the reservoirs should be much better safeguarded by larger control of the tributary district.

If the last condition is secured all the possibilities of the first need will at last be at command. Hence, it is in order to present some considerations bearing upon this aspect of the situation. It should be self-evident that the continued purity and safety of the surface drainage can only be assured by having entire control of the sources and the lines of stream flow. The supply depends upon the rainfall and the size of the area from which it is collected. In this case the area is hardly sufficient for the utmost needs without large increase of storage,—but, such as it is, all possibility of dangerous conditions should be removed. If there are any who would say that such a policy is prompted by mere fastidious theory, dainty sentiment or the “new fangled notions of sanitary cranks,” let them consider the following facts:

The Windsor (Vt.) epidemic was not far away nor very long ago. There was a case of typhoid fever on a hill farm four miles or more distant, and in the winter time. The infection (typhoid bacillus) from dejecta was washed down the brook and into the storage reservoir just above the village. The entire water works system was infected. Hundreds contracted the typhoid fever and many died. There was the usual investigation and report after the mischief was done; the system was pronounced unsafe, and a new source of supply had to be found.

The circumstances of the epidemic in Plymouth, Pa., in 1885, were quite similar. The situation was like that of Claremont, as there were three small reservoirs fed by a mountain stream, along or near which were a very few houses. A man from one of these houses went to Philadelphia and contracted typhoid fever. It was a bad case and the man was sick many weeks. The dejecta were thrown upon the snow and frozen ground and washed into the upper reservoir when the spring thaw came. It happened that on March 26th the superintendent had to thaw out the pipe leading from the upper reservoir to those lower down. The first typhoid case appeared in town on April 9th; after April 12 from 50 to 100 cases appeared daily, and in one day 200 new cases were reported. Out of 8,000 people 1,104 had the disease (almost one in seven) and 114 died. Thus the origin of all this sorrow and desolation was proved to be miles away on the mountain side, and it appeared that the typhoid bacilli retained their virulence after lying many weeks in frozen fecal matter and after coming some miles down stream in ice cold water.



The New Haven epidemic in 1901 is equally instructive. A part of the city is supplied from Dawson Lake on West River, five miles distant. About a mile and a half above the dam a small stream flowed into the river, and about half a mile up this stream was a farmhouse, in which occurred several cases of typhoid fever during January and February. The excreta were thrown into a shallow privy vault without disinfection; this vault was 325 feet from the brook and 40 feet above it. On March 10th and 11th came a heavy rainfall of  $2\frac{1}{2}$  inches. Although the lake covered 60 acres and contained 300,000,000 gallons it was quite turbid on March 11th. About ten days later the epidemic began in the district supplied by Dawson Lake, seven miles distant from the source of infection. During April, May and June 514 cases occurred, resulting in 73 deaths.

The Ithaca (N. Y.) epidemic of 1903, for the time being practically broke up Cornell University. There were 1,350 cases in a population of 13,156, or more than one sick among every ten. More than 500 homes were visited and there were 82 deaths. There were 3,000 students, hundreds of whom left town, some ill with the disease; these doubtless scattered the disease elsewhere. "One episode of the epidemic is worthy of special mention, namely a secondary outbreak which resulted from the infection of a well. This well had become popular among residents of a certain district at the time when the public supply came to be distrusted, and its quality was taken for granted. But the wife of the owner was taken sick with typhoid fever during the epidemic, and her dejecta passed without disinfection through the water closet, and into a drain pipe which ran within three or four feet of the well. The joints of the drain pipe were not tight, and the well water, which had probably been for some time grossly contaminated, finally became infected. As a result about fifty cases of typhoid fever and five deaths were traced to people who used the water of this well.

In the Scranton (Pa.) epidemic a reservoir containing one billion four hundred million (1,400,000,000) gallons became infected, so that during December, 1906, and January and February, 1907, 1,155 cases of typhoid fever were reported and 111 deaths.

The sad experiences of Littleton and Woodsville in this state and St. Johnsbury, Vt., under somewhat different conditions, all teach the same lessons of the prime necessity of safeguarding and vigilantly watching the sources of supply.

Mr. George C. Whipple, in a recent address, said: "When a community has been stricken with this dread disease, and when it has been

traced to the public water supply, with its branches leading into every house, public opinion is apt to emphasize its demands for pure water in a way that brings results. The influence of such an occurrence is felt not only in its own locality, but throughout the country at large. Perhaps no other single influence has saved so many lives from typhoid fever as typhoid fever epidemics themselves. A hundred deaths from the same cause occurring at once in a single community attract more attention than a thousand deaths in the same community scattered over a period of time; and if the protective measures adopted as a result of the epidemic serve to lower the general death rate even to a small extent, the ultimate saving of lives may far exceed the few lives lost during the period of excitement."

He was then urging the necessity of filtering public water supplies. Certainly that necessity is undeniable if the sources of supply are not thoroughly guarded. It is criminal to take chances when infection of the water is possible by any means.

In the light of these facts the two places or sets of buildings,—the wash from which must come promptly into the middle reservoir (unless special constructions are made on the premises to prevent, and these are constantly watched), especially when the run-off is on frozen ground,—constitute an ever-present menace to the purity and safety of your water supply.

Therefore,

Thirdly. My first recommendation is that the town obtain possession, or full right of control, of all the drainage area tributary to the upper and middle reservoirs.

Remarks: It has been shown by careful observations that grasses, oats and clover will absorb or consume from twelve one-hundredths to more than a quarter of an inch depth of water daily as a maximum; wheat somewhat less; but Indian corn in an extreme case nearly  $1\frac{1}{2}$  inches; while oaks and fir trees consume from one quarter to one tenth as much. In this consumption is probably included the evaporation from the plants. Hence forest growth not only protects the land from excessive evaporation, but itself requires far less of the rainfall. Therefore, the area for the collection and storage of water supply should be mostly wooded and the stream lines or brooks kept clean and clear from every form of vegetable rubbish.

Again, observations made throughout the year in Germany have shown that evaporation from water surfaces in the open country is about two and one-half times more rapid than from water surfaces shielded by forests. In extremely hot weather evaporation may be

as much as one eighth to one quarter of an inch daily from open ponds. Hence the great importance of full control of all of these conditions which affect the conservation of the water supply. The experience of the Hanover Water Works Company, with a water supply gathered from about 1,200 acres, the most of which has been owned and controlled by the Company for several years, coincides with the observations referred to above.

The cost of water pumped at Claremont, if I rightly interpret the figures reported, is about forty dollars per million gallons, including depreciation of the plant. At a low rate of interest this would justify an outlay of \$1,000 principal, to secure a storage of 1,000,000 gallons. In one case with which the writer is familiar the cost was \$1,000 for each 3,000,000 gallons stored; in another and very favorable situation 6,000,000 gallons were stored for each thousand dollars expended on the reservoir, based on contract prices. It ought to cost less if done by force account under direction of the superintendent. Probably it would hardly be worth while for Claremont to invest in another reservoir of less than 20,000,000 gallons' capacity, meaning by this water available for delivery into the town. I would therefore make a

Second recommendation, that if a suitable site for a reservoir can be found in the collecting territory where at least 20,000,000 gallons can be stored as available supply, at a cost not exceeding \$400 (four hundred dollars) per million gallons stored, it would be good policy to gain such additional storage. The site should have at least one hundred acres of collecting area tributary to it.

Your collecting area is not well adapted for cheap storage,—having a steep topography and quick run-off; but its possibilities should be studied and improved to the utmost that is financially expedient. The policy recommended will take time. The promotion of the forest growth, especially the increase of pines and spruces, will secure a better conservation of the snowfall and rainfall, and permit a more constant and long continued "ground storage." By thus utilizing all of the other possibilities of collection and storage on all of the territory within reach, it should be easily possible to double your gravity supply in the near future, that is, within a few years.

## CONCERNING CERTAIN WATER SUPPLIES.

---

### LACONIA.

Regulations for the protection of the purity of the waters of Lake Winnepesaukee and Lake Paugus were established by the State Board of Health, to take effect January 1, 1909, which, in substance, provide for the exclusion of sewage and other dangerous contamination from these bodies of water.

A condition dangerous to the health of the people of Laconia, by reason of that city's taking its water supply from Lake Paugus, has long existed by reason of the discharge of sewage into Lake Winnepesaukee near the channel through the water passes into Lake Paugus.

The City of Laconia, recognizing the menace to the health of its people, appointed a committee to take the matter into consideration, which committee sent the following communication to the State Board of Health:

*To the State Board of Health:*

The committee acting for the City of Laconia in the matter of your order to said city to take care of the sewage at The Weirs in said city, respectfully asks the opinion of the board upon the following questions:

If the City of Laconia should purchase the Laconia Water Company, and provide the same with a filter, and so give to its citizens pure water, would your honorable board say that no further action of your board would be necessary; or would your board in addition require a sewer system at The Weirs; or would your board require an adequate sewer system at The Weirs, and that the idea of the filter plant be abandoned?

An early answer to said questions is respectfully asked, because of some pending legislation to enable the City of Laconia to purchase the Laconia Water Company.

Respectfully yours,

(Signed) WILLIAM F. KNIGHT.  
JOHN T. BUSIEL.  
GEORGE W. HOYT.

February 24, 1909.

At a regular meeting of the State Board of Health, held March 1, 1909, after a full consideration of the subject, the board formulated and unanimously adopted the following, and authorized the secretary to transmit a copy of the same to the committee named, which was done:



It would seem to be irrational, illogical, and unscientific to pollute the water supply of a city, and then to establish a filtration plant, when the source of the pollution can be prevented. Especially is this true when the cost of removing the source of the pollution will not much exceed, and perhaps not even equal, the expenditure necessary to construct and maintain an efficient filtration system.

Moreover, there are other important considerations involved, outside of the urgent necessity to safeguard the water supply of the City of Laconia, in that the present and future residents, cottagers and campers upon the shore of the lake, summer visitors and the public generally should be protected in their inherent right to its waters and ice in an uncontaminated condition.

The waters of Lake Winnepesaukee and Lake Paugus are nominally of exceptional purity, as has been proven by many analyses, hence, if all sewage were excluded from Lake Paugus, there would be no necessity for filtering the water supply of the City of Laconia. The State Board of Health will, therefore, ask for the enforcement of the rules and regulations for the protection of the waters of Lake Winnepesaukee and Lake Paugus, adopted June 21, 1907, and it would recommend that the idea of establishing a filtration plant in lieu of sewage exclusion be abandoned.

### TILTON.

The following petition and statement were received at the office of the State Board of Health on January 12, 1909:

LAW OFFICE OF  
JOHN M. MESERVE,  
RAFFAELLY BLOCK,

TILTON, N. H., January 11, '09.

*Irving A. Watson, M. D.,  
Concord, N. H.*

MY DEAR DR. WATSON:—I am inclosing you a petition asking that the State Board of Health investigate the waters of Lake Winnisquam and make such rules and regulations as will protect the public health.

As you know, the sewerage from the City of Laconia has been drained into this lake for several years and the conditions there are alarming to say the least.

This petition does not represent all of our strength, and should the board desire a hearing, as I am in hopes it will, we will bring more evidence before them and more signers of the petition.

Trusting that you will notify the other members of the board and also let me know of any hearing it may call in the matter, I remain,

Yours very respectfully,

JOHN M. MESERVE.

CONCORD, N. H., January 12, 1909.

*John M. Meserve, Esq.,  
Tilton, N. H.*

DEAR SIR:—I am in receipt of your favor of January 11, inclosing a petition to the State Board of Health to establish regulations for the protection of Lake Winnisquam against any pollution that in its judgment would endanger public health.

This petition I shall lay before the board at its next meeting, which probably will not be until the third Tuesday in April, as the regular quarterly meeting has just



been held. Should a special meeting be called before that date, I will then submit the petition.

I might say, incidentally, that an examination of the conditions as they exist could not be thoroughly made until after the ice has gone out of the lake.

As there has been developed within a recent period a strong sentiment for the protection of our lakes and ponds against dangerous contamination, would it not be better for you and your petitioners to submit a bill to the Legislature for such legislation as might be deemed reasonable and effective, rather than to rely upon regulations that might be established by this board, the validity of which might be questioned?

It seems to me that some general legislation, which should take effect at some reasonable time in the future would be advisable.

Very truly yours,

IRVING A. WATSON,  
*Secretary.*

### STATE OF NEW HAMPSHIRE.

*To the Honorable State Board of Health:*

We, the undersigned, citizens, and taxpayers of the town of Tilton in the county of Belknap and State of New Hampshire, respectfully represent to this Honorable Board:

That Lake Winnisquam, located within the county of Belknap, in the towns of Tilton, Belmont, Sanbornton, Meredith and Laconia, is a public water and the source of water and ice supply to many owners of farms and summer homes along its shores;

That they have reason to believe that said water is being contaminated and that local regulations are not sufficient or effective to prevent such pollution.

Wherefore they pray that this Honorable Board will investigate the case, and establish such regulations as the board may deem necessary for the protection of said supply, against any pollution that in its judgment would endanger public health.

Dated at Tilton, N. H., July 29, 1908.

(Signed) C. R. Gould, M. D., *Member, Board of Health.*

Arthur T. Cass, *Member, Board of Health.*

C. A. Towns, *Member, Board of Health.*

H. A. Morse,

Walter C. Wyatt, } *Selectmen.*

C. Herbert Foss, }

Frank R. French.

George W. Lord.

Myron S. Calkin.

E. R. Jackson.

John G. Davis.

C. H. Thomas.

Osborn J. Smith.

John M. Meserve.

A. L. Worthen.

C. W. Abbott.

J. M. Dresser.

M. G. Keaser.

George K. James, Jr.  
A. S. Brown.  
W. J. Keyser.  
F. M. Clark.  
J. Greenwood.  
J. B. Erskine, M. D.  
M. C. Allen.  
E. A. Cole.  
L. F. Cadue.  
C. E. Marden.  
Elmer R. Gale.  
Arthur J. Roy.  
Ray H. Perkins.  
H. C. Boynton.  
E. F. Houghton, M. D.  
Luther H. Morrill.  
Fred N. Clark.  
George K. Burleigh.  
J. B. Smith.  
George B. Rogers.

Your petitioners further say that all of the sewerage from the City of Laconia is now and has been for a long time drained into said Lake Winnisquam; that many owners of summer homes and others are daily using the water for drinking and cooking purposes; that the refuse which is cast upon the shores becomes putrid and offensive in warm weather thus endangering the lives of those who may be near; that the draining of said sewerage into said lake as aforesaid is a great public nuisance and a menace to human life. Wherefore they pray that said board will investigate the case and make such rules and regulations as said board may deem sufficient to protect the public health.

The foregoing letter and petition were presented to the State Board of Health at its regular meeting, held April 20, 1909. The protection of Lake Winnisquam would necessitate the exclusion of sewage from The Weirs and the City of Laconia and from several points from these waters, which constitutes a problem of such magnitude that the board did not think it advisable to take action at the time; the petition was, therefore, laid upon the table.

At a subsequent meeting of the board, the matter was again considered in all its phases, and the board was unanimously of the opinion that it was impracticable at present to comply with the request of the petitioners, although recognizing the great desirability of the action asked for.

#### BRISTOL.

*To the State Board of Health of New Hampshire:*

We, the subscribers, residents of Bristol, Grafton County, New Hampshire, being largely dependent upon Newfound Lake, situated in the towns of Bristol, Alexandria, Hebron and Bridgewater, for our water supply for domestic purposes, believe that the

water of said lake is in danger of contamination and that the local regulations are not sufficient or effective to prevent such pollution: We therefore desire that the State Board of Health investigate the case and establish such regulations as they may deem necessary to protect the public health.

Charles W. Fling.  
 M. W. White.  
 H. H. Follansbee.  
 Lewis W. Fling.  
 C. H. Dickinson.  
 Kenson E. Dearborn.  
 Wilmer C. Cox.  
 Amos Blake.  
 A. E. Macuen.  
 Fred H. Ackerman.  
 Karl G. Cavis.  
 William H. Crafts.  
 G. B. Cavis.  
 F. M. Robertson, M. D.  
 Arthur Robie.  
 Henry Kenney.  
 D. M. Calley.  
 William C. White.  
 W. H. Marston.  
 F. S. Kirk.  
 A. H. Morrill.  
 R. W. Musgrove.  
 W. A. Gregory.  
 S. H. Dodge.  
 R. L. Pray.  
 George A. Robie.  
 C. L. Jeffroy.  
 E. S. Bickford.  
 B. H. Jewell.  
 B. Hadley.  
 Fred W. Bingham.  
 E. J. Glines.  
 Aldis J. Sanborn.  
 Clarence H. Webster.  
 G. B. Simmons.  
 George H. Bailey.  
 Samuel Reid.  
 Oley A. Kinley.  
 Frank F. Lougee.  
 L. L. Rollins.  
 F. A. Spencer.  
 C. A. Smith.  
 J. W. Coolidge.  
 H. T. Heath.  
 E. T. Hutchins.

H. H. Morrill.  
 C. C. Durgin.  
 William Henderson.  
 W. H. White.  
 I. B. Burpee.  
 Q. A. Ballou.  
 V. C. Wheet.  
 D. B. Weymouth.  
 E. E. Littlefield.  
 H. C. Field.  
 S. H. Cross.  
 George H. Fowler.  
 L. W. Heath.  
 E. C. Merrill.  
 R. C. Tenney.  
 Albro Wells.  
 J. A. Bickford.  
 E. M. Davis.  
 H. W. T. Norris.  
 E. E. Dickinson.  
 C. W. Holmes.  
 M. O. Edgerly.  
 B. M. Ames.  
 Fay Whipple.  
 E. F. King.  
 A. W. Chase.  
 J. E. Dowd.  
 D. Ned Trumbull.  
 H. G. Cate.  
 J. H. Breck.  
 Fred B. Gray.  
 Walter Decato.  
 Chester A. Tenney.  
 Sumner T. Smith.  
 H. D. Cheney.  
 W. J. Braley.  
 Alvin Goodhue.  
 John C. Goodell.  
 Denis Haley.  
 Will Casey.  
 W. D. Chandler.  
 E. P. Hill.  
 C. H. Marston.  
 Channing Bishop.

Early in May, 1910, following the receipt of the foregoing petition, an inspector of the State Board of Health, in company with a member of the board of health of the town of Bristol, made a careful inspection of the shores of Newfound Lake, examining into the general condition of some over sixty cottages and other buildings, so as to determine the magnitude of the problem to be solved.

Prior to the formulation of the regulations for the protection of Newfound Lake, the secretary visited Bristol and held a consultation with the Board of Water Commissioners and the board of health as to what requirements should be exacted to safeguard the waters of this lake, from which the town of Bristol takes its water for domestic and other purposes.

A full report of the inspection and the facts obtained in the consultation, above referred to, was laid before the board at its regular meeting, held August 9, 1910, at which time the following was adopted:

#### THE STATE OF NEW HAMPSHIRE.

---

WHEREAS, A legal petition has been presented to the State Board of Health, asking for the establishment of regulations to protect the purity of the water of Newfound Lake, under the provisions of Chapter 57, Laws of 1899, entitled "An Act for the Protection of Public Water Supplies," the following regulations are promulgated:

---

#### REGULATIONS OF THE STATE BOARD OF HEALTH FOR THE

#### PROTECTION OF THE PURITY OF THE WATER OF NEWFOUND LAKE In the Towns of Bristol, Bridgewater, Hebron and Alexandria.

---

1. No sewage from any public or private sewer or from any cottage, hotel, farmhouse, boarding-house or other abode, or from any privy, stable or out-building shall be allowed to enter Newfound Lake, or any inlet thereof.
2. No sewage of any kind or water that has been used for washing or cleansing either materials, person or foods, shall be allowed to run into said lake or into any inlet thereof, or into any excavation or cesspool in the ground, or onto the surface of the ground so near the water of said lake as to endanger its purity.
3. No dead animal or fish, or part thereof, or of any articles perishable or decayable, kitchen waste, swill or garbage shall be thrown into said lake or be deposited so near it as to be liable to endanger the purity of the water.
4. No boat either for public or private use, or houseboat or other construction for use on the lake shall keep, have or maintain a ship-closet or other construction of easement which shall permit excrement or other offal to fall or empty into the lake.
5. None of these things, materials or conditions mentioned in the foregoing regulations, or anything else that might endanger the purity of the said water or ice supply, shall be permitted to exist in such locality or manner as, in the opinion of the local

board of health, would be liable to contaminate the water or ice of the said lake or its tributaries.

6. No bathing shall be allowed in said lake so near the intake of the Bristol water supply as would be liable to contaminate the water, and the local board of health of the town of Bristol shall fix the bathing limits.

7. It shall be the duty of the board of health of the towns bordering on the lake to enforce these regulations, which shall take effect and be in force on and after September 15, 1910.

---

I hereby certify that the foregoing rules and regulations were adopted at a regular meeting of the State Board of Health, held at Concord, this ninth day of August, 1910.

IRVING A. WATSON,  
*Secretary.*



---

## **FOOD AND DRUGS INSPECTION.**

---



# REPORT OF FOOD AND DRUG INSPECTION.

By CHARLES D. HOWARD, *Chemist.*

---

*Dr. Irving A. Watson, Secretary State Board of Health:*

DEAR SIR.—I herewith submit my report of food and drug inspection for the biennial period ending August 31, 1910.

The summary shows a total of 1,304 examinations of food and drug products. Such work has occupied but a portion of the time of this department and is exclusive of examinations of water, also of liquor inspection for the State License Commission, as well as examinations of road materials for the State Highway Department, and further examinations for the public of miscellaneous character.

During the past year the work of food and drug inspection has been placed upon a much better basis through the appointment of a regular inspector attached to your board. Thus far, however, but a small proportion of the time of this appointee has been devoted to the collection of samples. It is expected in the near future to develop a regular system of inspection, permitting of a more or less thorough check being maintained, not only as to the sale of food and drugs of legal character but upon the sanitary conditions obtaining at the places where such sales are made.

## LEGISLATIVE NEEDS.

To this end there is urgent need of a law supplementing the present legislation relative to slaughter houses. This should be extended to include conditions, not only at stores and markets, but at every place where food products of any description are handled or stored, and, further, such a law should be made to include specific provisions for enforcement, thus extending the present investigative limitation.

At the last session of the Legislature the following bill providing for sanitary inspections in connection with the production and sale of food products was introduced:

## AN ACT

To Promote the Sanitary Production and Distribution of Food and Defining the Duties of the State Board of Health in Relation Thereto.

*Be it enacted by the Senate and House of Representatives in General Court convened:*

SECTION 1. The existence or maintenance of any unclean, unhealthful or unsanitary condition or practice in any establishment or place where food is produced,

manufactured, stored or sold, or of any car or vehicle used for the transportation or distribution thereof is forbidden.

SECT. 2. For the purpose of this act the term "food" as used herein shall include all articles used for food, drink, confectionery, or condiment, whether simple, mixed, or compound, and all substance and ingredients used in the preparation thereof. And for the further purpose of this act unclean, unhealthful, or unsanitary conditions or practices shall be deemed to exist if the floors, side-walls and ceilings are not properly constructed and maintained subservient with this requirement; or if food in the process of production, storage, sale or distribution is unnecessarily exposed to flies, dust or dirt, or to the products of decomposition or fermentation incident to such production, storage, sale or distribution; or if any person is being permitted to use as a sleeping room any place where food is prepared for sale, stored, served or sold; or if any employer shall knowingly permit or suffer any person who is affected with consumption, tuberculosis or any other communicable disease to work in such place; or if there is any other condition or practice which shall be deemed as endangering the wholesomeness of food.

SECT. 3. The State Board of Health, or its inspectors, or special agents designated for that purpose, shall have full power and authority at all times to enter and inspect every building, room, or other place occupied or used for the production, storage, sale or distribution of food, and all utensils and appurtenances relating thereto. And if any person, firm or corporation is found to be violating any of the provisions of this act, then the state board of health shall issue an order to the aforesaid to abate the condition or practice in violation, within such time as may be deemed reasonably sufficient therefor. Such order shall be transmitted by registered mail and the receipt of the postoffice department thereof shall be *prima facie* evidence of its receipt by the person or persons affected.

SECT. 4. The State Board of Health is empowered to make all necessary rules and regulations for the enforcement of this act; and it shall be the duty of local boards of health to assist in carrying out the provisions of this chapter whenever so requested by the State Board of Health.

SECT. 5. Any person, firm, company or corporation violating any of the provisions of this act and failing to comply with the lawful orders and requirements of the state board of health duly made and provided in sections 3 and 4 of this act, or whoever hinders or obstructs any inspector in the pursuit of his lawful duty, shall be guilty of a misdemeanor, and upon conviction shall be punished by a fine not exceeding ten dollars.

SECT. 6. All fines collected for the violation of this act shall be paid to the state treasurer, who shall deposit such money to the credit of a fund to be used for the carrying out of the provisions of this act and for the inspection of foods and drugs, such fund to be drawn against under the approval of the governor and council.

SECT. 7. This act shall take effect and be in force upon its passage.

This bill represents in an appreciably modified form a bill proposed by the State and National Association of Food and Dairy Departments and which has already been enacted into law by a number of the states. In all, a large proportion of the states have now adopted sanitary food laws of some kind and it has become urgently necessary for the welfare of the citizens of New Hampshire that some action in this direction be

taken at an early date. While the above bill contains some defects—in favor of the producer or merchant—still it could be made to serve effectively, either in its present form, or in an abridged one which would confer upon the State Board of Health authority to promulgate definitions and regulations, with a penalty for violations of such. For no satisfactory reasons this bill was unexpectedly defeated in the Senate after having received the endorsement of the House.

#### FOOD STANDARDS.

A bill providing for the enactment of food standards was also defeated. It encountered violent opposition on the part of certain local distributors, but that such opposition did not originate within this state but was instigated, organized and directed through a firm of New York attorneys, and that the association which the latter represented was active in opposing similar legislation in every state of the Union, is significant of the tremendous efforts which are being brought to bear to check any and all further attempts at legislation designed to place any restraint upon the production, distribution and sale of food products.

Nevertheless, there can be no logical objection urged to the enactment of a properly flexible set of food standards. Necessarily, the quality of almost every article is measured by a standard of some kind. The desire of certain food interests to have the present chaos in this connection maintained is not inspired from any respect for the consumer's welfare. The introduction of a section into the Food and Drugs Law, providing that the standards of the United States Department of Agriculture shall become the legal standards of this state, could work no hardship to any honest manufacturer or dealer, for the reason that such standards represent certain maximum and minimum limits, so broad in their scope that any unsophisticated food product, which was strictly what it purported to be and in fit condition to be sold without any qualifying description, would have no difficulty in falling well within such limits.

#### COCAINE LAW.

The enforcement of a law regulating the sale of preparations containing cocaine devolves upon this department. This law has proved in operative, due to a defect in the phraseology.

#### LAW RELATING TO SALES OF RENOVATED BUTTER.

An amendment to the milk law, passed during the last session and which requires the stamping of the retail package in connection with



sales of renovated butter, has been found to be faulty and insufficient in its provisions. This section should be revised.

#### WEIGHTS AND MEASURES.

Statutory provisions in this connection are very meager in character. Sealers of weights and measures are instructed to inspect the scales and measures employed in the sale of commodities, but there is no provision whatever for investigation and punishment in connection with sales involving short weight or measure. The milk law contains a requirement effecting the sale of milk in this regard and the general food law touches the matter only to the extent of requiring that *if the package bear any statement of weight or measure at all* (which it need not bear) such statement must be the true one—a requirement that is somewhat superfluous in that such a matter is well covered by the general provision effecting misbranding. Aside from the above there is nothing in the statutes standing between the people of New Hampshire and the consciences of their dealers. The need of legislation of this character has been conspicuously indicated by revelations occurring in other states of late and while it is not questioned that a majority of our merchants are thoroughly honest in a desire to give full value, still, human nature is the same in this state as elsewhere.

Especially is there need of a law regulating the sale of foods by measure. As evidence of this, the large number of “short” berry boxes noticeable in our markets during the past two or three seasons may be cited. Our investigations show that the “shorts” hold about 85 per cent. only of a full, or standard, quart basket. In other words, they are less than one fifth smaller,—just small enough to make it worth while for the dealer, without being small enough for the average unwary purchaser to notice any difference. The fact that these boxes are stamped upon the bottom with the word “short” in some cases, affords no protection to the consumer, while such a box does afford an opportunity to the not over-scrupulous dealer, seeking to create competition, to sell his wares at a seemingly slightly lower price while actually receiving an excessive one. In other states laws have recently been enacted forbidding the sale of “shorts,” such laws providing that the sale of berries or other commodities offered to the public in small boxes shall involve the use only of full, standard size quarts, pints or half pints.

While the food law provides that if the label upon commodities states any weight or measure, such weight or measure shall be the

true one, but a small proportion of the food stuffs on sale bear such a statement. Instead, in a large proportion of cases, the packages are made to approximate in size or appearance the standard pound, quart or other unit denomination of weight or measure, being, however, usually a certain amount short of such apparent quantity. Thus goods are billed to the retailer as "ones," "threes" or "fives," the implication being that such packages contain one, three or five pounds, respectively, and when the consumer calls for such a quantity, one of these pseudo "pounds," or its multiple, is delivered. In a number of instances we have been in receipt of complaints bearing upon the now notorious deceit in connection with the sale of lard in pails, and this deception, involving the charging in of the weight of the container as a part of the price of an expensive food stuff, applies to many other articles.

Yet there seems to be no present legal redress for any of the frauds involving short measure or weight except, as already mentioned, in the instances where such net weight or measure is declared upon the package label. There is immediate need of legislation establishing the size of containers used in the sale of fruit, vegetables and articles in bulk, and providing penalties for fraudulent sales.

For the further protection of the consumer, there should be a provision requiring that when the weight or volume of a packaged article differs from what it purports to be, as, *e. g.*, a full pound or quart, such net weight or volume shall be stated upon the label. I am aware that there is considerable opposition in certain quarters to such an enactment; nevertheless, I have failed to observe any really legitimate or unanswerable argument having been advanced in support of this opposition and the only conclusion is that the latter is inspired solely by an aversion to losing the opportunity to continue enjoying the increased profits accruing as a result of deceiving the public. It is not conceivable that there can be any basis of truth in the argument that such labeling will be responsible for any real or permanent increase in the cost of any article. The increased cost involved in the packaging of articles formerly sold in bulk has already been incurred. Packers of food products invariably aim to place a certain amount of an article in a package—no more and no less, and it is as easy to make the package contain one pound as to contain uniformly fifteen ounces, only.

#### FALSE ADVERTISING.

Since the passage of the Food and Drugs Act, one of two prominent opportunities for deception has been largely eliminated. The purveyor

of dishonest or questionable products now finds it dangerous to depart too far from the truth in what he states upon his labels. But one avenue of misrepresentation is still open; though the label must now tell the truth, there is no such requirement as regards the advertising copy accepted by the average periodical. And notwithstanding the increasingly numerous "fraud orders," the mails are continuing to prove an important auxiliary to the assistance imparted through the not overparticular magazine or newspaper.

As a matter of fact, for purposes of deception, untruthful labeling becomes puny and insignificant when compared with the advertisement that daily confronts a potential victim from the latter's newspaper or some bill-board. Undoubtedly, this is where the mischief is really accomplished in the majority of instances—for the reason that the dupe rarely sees the label before purchasing, whereas, it is the advertising that induces him, not only to make the initial purchase but, by continuous "hammering" and enlisting his powers of imagination, to continue the treatment. Laws regulating advertising, although hitherto derided as "freak" legislation, are now seriously being considered as a very necessary means for checking a great evil, and already two states have recently succeeded in securing the passage of such enactments.

A prominent example of this class of advertising is furnished by the Pond's Extract Company. The following is taken from a circular letter recently received by the writer. The italics are ours:

"The chances are that you already use Pond's Extract after shaving . . . but if you do not it must be because you have never tried it. This in turn must be either because you have been told that it is '*just the same thing as witch hazel*,' or else you consider it too expensive. As for the first, the man who tells you that Pond's Extract is the same thing as *witch hazel* is either *misinformed* or has an axe to grind. Pond's Extract is *purser, many times stronger*, and has a softer, more agreeable odor than *witch hazel*. Moreover Pond's Extract is matured for two years in oak casks, a process which permits important chemical changes and *greatly enhances its healing properties*. . . . The use of Pond's Extract after shaving will cost you one-half cent more per day than *witch hazel*. . . ."

The basis of misrepresentation involved in the above and other matter is that Pond's Extract is alleged as being an entirely different thing from *witch hazel*—that its peculiar virtues are such as to render it a sort of general panacea for a host of diversified ills,—external, internal, acute, chronic and constitutional. On the contrary, our

investigations show that this preparation does *not* differ in any essential therapeutic respect that can be detected, from any other good preparation of hamamelis and that it is, in short, nothing else than aqua hamamelis. While we are not fully prepared to deny the truth of the above claim that this product has been "matured for two years in oak casks" (a statement not confirmed by the tannin test) yet assuming that this does take place, it is difficult to see wherein such maturation could in the slightest degree enhance its value as a curative agent—though it is conceded that it might have some effect in improving it *as a perfume*.

#### PROSECUTIONS.

Upon the basis that in general an occasional prosecution for the purpose of "jogging" the public's memory is to be preferred to any extended efforts in this direction—especially where the dealer is not a wilful violator—but relatively few cases have been brought in the courts during the past two years. Those presented for trial (with convictions secured in every instance) have included mainly prosecutions for the sale of adulterated (watered) milk, vinegar, ice cream and flavoring extracts.

It has become apparent, however, that for the effective enforcement of the law, greater activity in this connection is demanded in the case of a certain class of dealers and with certain products. At the present moment a batch of cases is under consideration, and in the future it is expected that the inspector, in addition to looking after general conditions, will devote a special effort toward securing evidence necessary for the prosecution of the more flagrant violations noted.

#### \* SUBSTITUTES AND IMITATIONS.

For almost every manufactured article of food of standard quality, the market affords a substitute or an imitation. Manufacturers claim that the public continually clamors for "something cheap" and that it will not pay the price that genuineness and real quality demand. In reality this is more or less of a libel upon the public. It is not to be presumed that the latter is actuated in purchasing an article of small price so much by a desire to get an inferior product as to secure a bargain. The true reason for the existence of such goods is to be found in the attempt to utilize waste products, coupled with competition and the striving for greater profits; also in the fact that most of these articles are legitimate products, if sold for what they are and at

\* *Sanitary Bulletin*, January–April, 1909.



proper prices. The following will serve as illustrations of some of the goods "supplied in response to the public demand":

Tomato catsups made, not from "red ripe tomatoes" (as the labels are continuing to claim in some instances), but from the offal of the canning establishments—cores, skins, rotten fruit, green fruit—all such refuse being bought up regularly by certain catsup manufacturers and converted into catsup, usually with the addition of "a little harmless coloring," generally with some starch to impart smoothness and body, and invariably benzoate of soda—manufacturers themselves now acknowledging that the latter is unnecessary in connection with sound products.

Another class is to be found in the compound jellies and preserves, the basis of which is the "apple stock" obtained by cooking and filtering evaporator waste.

Molasses vinegar and colored spirit vinegar—perfectly wholesome in themselves—cost the dealer much less money than cider vinegar, and it is nothing unusual to find these being substituted on an order for the latter.

In most cases the public pays as much or nearly as much for the co-called "blended" maple sugar, containing perhaps 10 per cent. of maple, as for the genuine article, while the "cane and maple" syrup mixtures cost the consumer more than he would have to pay for the same quantities of maple syrup and cane sugar if bought separately.

A recent purchaser of cream of tartar discovered that he had been sold a mixture of acid phosphate and starch labeled as "cream tartar compound," notwithstanding that the regular price of the former had been paid. Investigation showed that this article had cost the retailer much less than would have cream of tartar, while the cost to the packer was less than one fourth that of the grape product.

While all of these products were, without any compunctions, formerly labeled and sold as the genuine, the advent of food laws has, of course, placed a decided check upon such practices. Nevertheless, the impulse on the part of the manufacturer to lead the purchaser to believe his product is a standard article or at least better than it actually is, seems irresistible, and apparently much money has already been expended in the purchase of legal advice relative to means of accomplishing this end and at the same time of escaping any liability under the law.

In this connection the following are offered in illustration of the labeling now being applied to certain brands of extracts. In the first example it will be noted that the manufacturer's name does not appear



upon the package—quite naturally, in view of the fact that the company also makes a line of standard extracts well known throughout the state.

# HALL BRAND EXTRACT LEMON

---

CONTAINS  
OIL LEMON 4M  
60% ALCOHOL 1 OZ.

---

UNIFORM QUALITY

---

PREPARED AT  
36 & 38 BROWN ST.  
PORTLAND, ME.

# MANHATTAN CLUB EXTRACT OF PURE VANILLA

---

FORMULA  
CONTAINS 25 PER CENT  
OF ALCOHOL  
SATURATED WITH  
PURE VANILLA BEANS

---

PREPARED BY  
J. H. FOLKINS CO.  
BOSTON, MASS.

A fair general test of misbranding is the ascertaining of whether or not the character of the labeling is such as to be “likely to cause confusion or mistake in the mind of the public, or to deceive purchasers” (Trademark Act of February 20, 1905). In the above case there is no warrant or justification for the use of the apothecaries’ formula; such conveys no information to either purchaser or dealer. Interpreted, it means that the amount of lemon oil in this brand is but 0.83%, or but 16.6% of what standard extract of lemon will contain.

The purchaser of the above would be justified, from the labeling, in believing, not only that this is standard extract of vanilla, but, being “saturated with pure vanilla beans,” is presumably one of exceptional strength. But the extract manufacturer knows that alcohol of 25% will take but little from the bean, and in fact, this extract is exceedingly weak and a very dear article for the consumer to buy.

(FACE OF CARTON.)

**FOLKINS  
EXTRACT  
OF  
ORANGE**

For Flavoring Cakes, Ice Cream,  
Sauces, Etc.

PREPARED BY  
**J. H. FOLKINS & CO.**  
BOSTON, MASS.

(LABEL ON BOTTLE.)

**CONCENTRATED  
EXTRACT  
OF  
ORANGE**

For Flavoring Ice Cream, Jelly,  
Sauce, Pastry, Custard, Etc.

**FORMULA.**

Oil of orange expressed from fresh	
orange peel . . . . .	1.5 pts.
Alcohol pure, 94% . . . . .	80.0 "
Coloring . . . . .	q. s.
Water . . . . .	18.50 "
	<hr/> 100.00

PREPARED BY  
**J. H. FOLKINS CO.**  
CHELSEA, MASS.

(STATEMENT ON SIDE OF CARTON.)

This extract is carefully prepared from selected materials and will be found superior in strength and flavor to a similar article of any other make.

In the above case the labeling of the carton (which is the only part of the package observable until opened for use) not only contains no intimation that the article is not a standard extract, but it actually purports to be "superior in strength and flavor." The label attached to the bottle represents the contents as a "concentrated" extract, and the manufacturer then attempts to justify all this by the formula that follows, the latter including, it will be noted, "coloring," added unquestionably for the purpose of leading the consuming public unversed about formulas, to believe that the extract is of standard strength.

## SUMMARY OF FOOD EXAMINATIONS.

Following is a summary of the food examinations made during the period covered by this report. It being the practice to collect only suspected brands, and only those kinds of food liable to adulteration or misbranding, these figures should not be construed as necessarily representing the general condition. For this reason no percentages of adulteration are here given.

	Total samples.	Not conformable.
Baking powders.....	13	2
Bottled sodas and tonics.....	17	13
Butter.....	39	22 *
Catsups and table sauces.....	14	4
Coffee and coffee substitutes.....	7	5
Condensed milk.....	23	2
Cream.....	24	5
Cream of tartar.....	6	1
Cocoa.....	18	11
Celery salt.....	4	2
Cider.....	13	5
Canned meats.....	3	0
Fish.....	15	3
Flavoring extracts, lemon.....	35	21
Flavoring extracts, vanilla.....	35	16
Flavoring extracts, miscellaneous.....	35	23
Honey.....	8	0
Ice cream.....	128	68
Jellies, jams and preserves.....	13	2
Lard.....	4	0
Grape juice.....	12	7
Milk.....	382	131
Maple and mixed sugars.....	14	1
Maple and mixed syrups.....	22	6
Molasses.....	11	0
Edible oils.....	30	6
Oysters.....	46	14
Spices.....	26	1
Table salt.....	9	5
Vinegar.....	68	17
Miscellaneous.....	29	4
	<hr/> 1,103	<hr/> 397

\* Includes sales of renovated butter not properly marked.

## MILK.

Three hundred and eighty-two samples have been examined, of which one hundred and thirty-one were found to be below standard, adulterated by addition of water or skimming, or classed as illegal because of dirty condition. During the past two years no instance of the use of preservatives has been encountered.

An act in amendment of section 18 of the milk law, approved April 9, 1909, provides for a reduction of the minimum standard for milk solids from thirteen per cent., as formerly required during the winter months, to twelve per cent. for all seasons. This section as amended also establishes, in the case of cream and butter, minimum fat standards of eighteen and eighty per cent., respectively, and there is a further provision affecting the labeling of renovated butter.

In connection with the milk examinations made at this laboratory, attention is given to the sanitary condition of the sample as well as to the determination of quality and freedom from adulteration. While this is most valuable work, it is hampered to some extent at present by reason of the fact that neither standards nor methods of operating have as yet been fully developed and perfected.

The following table contains data showing examinations of milk found to be watered or skimmed. While no less than thirty-two samples of watered milk are here reported it needs to be emphasized that many of these represent duplicate collections from the same dealer. Six of the latter were prosecuted, all paying fines, which ranged in amount from \$10 to \$50, with and without costs. Some of these cases represent, not dealers who are selling this product to New Hampshire consumers, but producers shipping to Boston contractors and concerning whom repeated complaints had been received. Relative to the question as to the extent of the sale of watered milk within the state, our only guide is the result of the examination of samples submitted by the local inspectors, and it is but rarely that such samples are found to indicate milk other than of good quality, so far as composition is concerned, although there is still a woeful lack of cleanliness apparent in connection with some of the milk produced. An effort is being made to impress the fact upon both local inspectors as well as dealers and producers that dirty milk is not only much more dangerous than watered milk but under the law its sale is just as illegal.

## MILK ADULTERATED BY ADDITION OF WATER OR SKIMMING.

No.	Producer or dealer	Total Solids per cent.	Fat per cent.	Refract. at 20° C.	Remarks.
4142	F. E. Brooks, Berlin (L. A. Brown).....	10.38	3.2	36.5	Watered.
4285	Conway Lunch Room, Berlin.....	11.36	2.5	.....	Skimmed.
4290	Submitted from South Acworth.....	9.99	0.5	.....	Skimmed.
4170	John Byk, Manchester.....	8.12	0.4	39.2	Skimmed.
4171	Sam Hudzik, Manchester.....	8.20	0.4	39.6	Skimmed.
4180	Submitted from Lincoln.....	10.44	2.7	.....	Watered.
4425	Submitted from Berlin.....	10.44	2.8	.....	Watered.
4455	T. W. Beckwith, Berlin (L. French).....	8.67	2.8	33.2	Watered.
4476	Submitted from Concord.....	11.22	.....	36.6	Watered.
4518	Submitted from Portsmouth.....	.....	1.7	.....	Watered or skimmed (sour sample).
4519	Submitted from Portsmouth.....	.....	1.6	.....	Watered or skimmed (sour sample).
4807	F. E. Brooks, Berlin.....	11.40	4.0	36.5	Watered.
4858	Omer Pepin, Bedford.....	11.34	3.7	38.0	Watered.
4859	Omer Pepin, Bedford.....	11.11	3.7	38.0	Watered.
4860	Omer Pepin, Bedford.....	10.49	3.4	36.8	Watered.
4861	Omer Pepin, Bedford.....	10.48	3.7	36.0	Watered.
4870	L. H. Ward, Hampton.....	6.92	2.2	30.0	Watered.
4862	W. L. Hilliard, Kingston.....	10.72	3.7	35.0	Watered.
4863	W. L. Hilliard, Kingston.....	11.34	3.5	38.0	Watered.
4864	W. L. Hilliard, Kingston.....	10.32	3.5	36.0	Watered.
4865	W. L. Hilliard, Kingston.....	11.43	4.0	36.8	Watered.
5077	H. P. Clough, Concord.....	11.14	3.1	38.4	Watered.
5078	Perley Badger, Concord.....	10.22	1.4	40.9	Skimmed.
855	R. P. Hanno, Lisbon.....	10.04	3.3	34.1	Watered.
856	R. P. Hanno, Lisbon.....	11.84	4.0	38.1	Watered.
857	R. P. Hanno, Lisbon.....	9.70	3.3	34.0	Watered.
858	R. P. Hanno, Lisbon.....	10.04	3.3	34.5	Watered.
848	Merrill Tewksbury, Bath.....	11.36	3.9	38.2	Watered.
849	Merrill Tewksbury, Bath.....	11.22	3.7	38.2	Watered.
845	Merrill Tewksbury, Bath.....	11.22	3.7	38.3	Watered.
846	Merrill Tewksbury, Bath.....	11.16	3.8	38.1	Watered.
847	Merrill Tewksbury, Bath.....	10.64	3.4	37.9	Watered.
5276	R. E. Emery, Lyndeborough.....	10.42	3.0	35.0	Watered.
5277	R. E. Emery, Lyndeborough.....	10.80	3.1	35.0	Watered.
5278	W. R. Russell, Lyndeborough.....	11.12	3.2	38.1	Watered.
5279	W. R. Russell, Lyndeborough.....	11.09	3.4	37.5	Watered.
5280	W. R. Russell, Lyndeborough.....	10.62	3.2	36.9	Watered.

Fine \$10 and costs.



## RENOVATED BUTTER.

Twenty-two sales of unlabeled renovated butter were noted, as follows:

## RENOVATED BUTTER—ILLEGAL SALES.

No.	Dealer.	Remarks.
4940	Submitted from Keene.....	Renovated butter. Sold as "Elgin Creamery."
4947	Cloverdale Co., Concord.....	Renovated butter.
5008	W. D. Prince, Manchester.....	Renovated butter.
4985	G. T. Robinson, Manchester.....	Renovated butter.
4986	E. C. Voisard, Manchester.....	Renovated butter.
4987	Bourgeois & Co., Manchester.....	Renovated butter.
4989	Griffin & Duguay, Manchester.....	Renovated butter.
5015	N. Lefond, Manchester.....	Renovated butter.
5001	A. D. Lemay, Manchester.....	Renovated butter.
5002	P. J. Charron, Manchester.....	Renovated butter.
5003	S. E. Gagnon, Manchester.....	Renovated butter.
5005	Guardet & Boulanger, Manchester.....	Renovated butter.
5006	F. B. Johnson, Manchester.....	Renovated butter.
5007	Lamoureux Bros., Manchester.....	Renovated butter.
5014	Manchester Grocery Co., Manchester.....	Renovated butter.
5012	Gorman Bros., Manchester.....	Renovated butter.
5011	Dumas & Prince, Manchester.....	Renovated butter.
5123	Submitted from Concord.....	Renovated butter. "Creamery."
1095	H. C. Snell, West Manchester.....	Renovated butter.
1096	Adelbert Lemay, West Manchester.....	Renovated butter.
1098	F. C. Harbour, West Manchester.....	Renovated butter.
1033	Cloverdale Creamery, Rochester.....	Renovated butter.

## ICE CREAM.

During the last legislative session the ice cream law was amended so as to permit of the use in ice cream of "not more than one fifth of one per cent. of filler." Under the latter head is included, in addition to the eggs originally allowed, such articles as gelatin, cornstarch, flour, gum tragacanth, agar-agar, Irish moss, and any other edible substance possessing the property of swelling up or gelatinizing when appropriately treated with water.

As defined by the State and National Food Standards, the term "ice cream," unless specially qualified, is logically applied only to "the frozen product made from cream and sugar, with or without a natural flavoring." While, as has been previously shown, the primary object in the use of "fillers" would seem to have been for the purpose of replacing cream in sub-standard products, yet there has been a demand from some quarters for the use of small amounts of these articles because of the property they possess of maintaining the consistency of ice cream when shipped or carted and also when kept for considerable lengths of time. Hygienically, the latter would appear to be a doubtful advantage, although it is probably true that existing commercial conditions in the ice cream business demand the use of such articles to some extent.

In the case of the samples collected under the amended law no attempt has been made to determine the proportion of filler, although in a few instances it was obvious that such must have been appreciably in excess of the one fifth per cent. allowable. That the latter may properly be regarded as a fairly liberal allowance is suggested by the fact that as little as one per cent. of gelatin is required to produce a "jelly" with water alone.

In many instances where the use of a filler is apparent, it has proved difficult to determine its exact character, frequently on account of the fact that some commercial product has been employed. These are generally mixtures, and while many of them contain starch or gelatin, or both, other constituents are generally present. These are usually of a gummy character and include such products as gum tragacanth, "sea moss farine," etc.

One of the most serious objections to fillers in ice cream is that certain ones allow of the product being whipped up to such a light and frothy consistency that a pint of such may contain actually much less butter fat, and therefore less ice cream, than another product testing considerably lower as to fat. There is a great deal of difference in this respect, and it explains why some brands of ice cream can be sold (by volume), so much cheaper than can others testing just as high. Under present conditions, with the use of a filler legally sanctioned, the only equitable way to sell ice cream is by weight.

Of the one hundred twenty-eight samples examined, sixty-eight failed to conform to requirements, generally because of deficiency in content of butter fat. In many cases this was but slight. The following represent samples found to be deficient:

No.	Collected of	Fatpercent.
4147	C. Chickles, Penacook.....	11.0
4158	John Papoulos, Somersworth.....	8.0
4159	Eli L. Barber, Somersworth.....	7.0
4160	H. Desmarais, Somersworth.....	10.8
4205	J. F. O'Dea, Hampton Beach.....	4.0
4207	Dudley & White, Hampton Beach.....	5.0
775	O. H. Piper, Laconia.....	8.4
4628	Joseph Lazor, Nashua.....	8.3
4678	George F. Georgi, Suncook.....	7.5
4691	Edward Hoyt, Manchester.....	10.5
4698	Abbidi Maxoret, Suncook.....	3.0
4715	Push-cart dealer, Concord.....	4.0
4735	Submitted from South Lyndeborough.....	9.8
4749	Dan Daoust, Manchester.....	7.1
4757	George Varney, Dover.....	9.0
5293	George Fisk, Concord.....	2.8
5175	Submitted from Milford.....	6.8
5260	Gieomo Behnush, Pembroke.....	2.0
5213	Joseph Dondero, Portsmouth.....	10.0
5214	P. J. Tilton, Portsmouth.....	6.0
5237	Joseph Dondero, Portsmouth.....	6.7
5244	B. M. Tilton, Portsmouth.....	6.8
5276	E. H. Libbey, Portsmouth.....	8.4
5298	C. O. Garland, Rochester.....	10.6
5299	Lightbody Drug Co., Rochester.....	9.4
5305	J. Costello, Rochester.....	9.0

### FLAVORING EXTRACTS.

One hundred and five extracts used for flavoring purposes have been examined, sixty of which were classed as illegal. These are divided into: vanilla, total 35, illegal 16; lemon, total 35, illegal 21; miscellaneous, total 35, illegal 23. The miscellaneous extracts included orange, peppermint and wintergreen, also various "fruit" extracts not labeled to show their imitation character.

An interesting line of flavoring preparations, put out by J. M. Pitkin, Newark, N. J., consists of a mixture or emulsion of the different flavoring principles with glycerin and what appears to be gum tragacanth so as to form a paste. The manufacturer rightly claims that

much of the cost of an extract is in the non-flavoring vehicle, *i. e.* the alcohol, and to this extent his scheme seems a commendable one. Unfortunately he goes altogether too far in the claims he makes as to the strength of some of his products. The tubes sell for twenty-five cents, which is emphasized as being the price one would pay for "a two-ounce bottle of good alcoholic extract," whereas it is represented that one such tube is "actually equivalent to about ten ounces of the best alcoholic extract, which would cost \$1.25." As though this were putting it too modestly, in another part of the circular the value of a twenty-five cent tube in terms of standard extract is stretched up to "about a pint."

An analysis of the lemon of this brand shows but 2.83% by weight of lemon oil. This represents a quantity of oil in one tube which if, dissolved to two ounces, would give a solution of but one-fifth standard strength, or, to put it another way, the quantity of oil actually present is sufficient to make less than one-half ounce of standard extract. From which it is evident that instead of getting five times the value of two ounces of standard extract as claimed, one is in reality receiving but about one-fifth the value of such two ounces.

## VANILLA EXTRACTS FOUND ADULTERATED OR MISBRANDED.

No.	Brand.	Manufacturer.	Collected of	Remarks.
4161	Extract Vanilla.....		Submitted from Manchester.....	Adulterated with coumarin.
814	Highly Conc. Vanilla Extract .....	Howe & Quimby, Claremont.....	Howe & Quimby, Claremont.....	Vanillin 0.050%. Art. colored. Sample not "highly concentrated." Misbranded.
803	Mayflower Extract Vanilla.....	A. Colburn Co., Philadelphia.....	C. M. Mann, Newport.....	Vanillin 0.025%; art. colored. Below standard.
4324	Basfine's Extract Vanilla.....	Basfine & Co., New York.....	Union Gro. Co., Manchester.....	Vanillin 0.075%. Art. colored. (Old stock).
4325	Manhattan Club Extract of Pure Vanilla.....	J. H. Folkins, Boston.....	M. D. Knox, Manchester.....	Vanillin 0.025. Not properly labeled.
4326	Twentieth Century Ext. Vanilla.....	M. D. Knox, Manchester.....	M. D. Knox, Manchester.....	Vanillin 0.250%. Vanillin content high for a natural extract.
4327	Jackson's Ext. Vanilla (marked "compound")	A. B. Jackson & Co., New York.....	Emery Bros. & Co., Suncook.....	Vanillin 0.025%. Label unsatisfactory (old stock).
4328	Fiedler's Flavor of Vanilla.....	Germania Medicine Co., Lawrence, Mass.....	P. F. Grenier, Manchester.....	Vanillin 0.200%. Formula claims 0.800%. Misbranded.
4495	Granite State Premium.....	Granite State Tea Co., Contoosook.....	Submitted from Contoosook.....	Adulterated and misbranded; artificial product
4567	Kellogg's Pure Extract Vanilla.....	F. P. Adams & Co., Boston.....	Poor's Market, Manchester.....	Adulterated with coumarin.
4716*	Concentrated Extract Vanilla.....	C. H. Eddy & Co., Brattleboro, Vt .....	Submitted from Nashua.....	Misbranded.
4780†	Compound Concentrated Extract of Water White Vanilla	Theodore Metcalf Co., Boston.....	J. R. Yeaton, Portsmouth.....	Adulterated and misbranded.
5060	Green Mountain.....	C. H. Eddy & Co., Brattleboro, Vt .....	Earl Warren, Westmoreland.....	Misbranded and adulterated.
5061	High Grade Ext. Vanilla.....	C. H. Eddy & Co., Brattleboro, Vt .....	Earl Warren, Westmoreland.....	Misbranded and adulterated.
4722	Pure Conc. Extract Vanilla.....	J. B. Marchand, Berlin Mills .....	J. B. Marchand, Berlin Mills.....	Adulterated with coumarin and artificial color.

\*No. 4716, conspicuously labeled as "Concentrated Extract of Vanilla" and as "Strictly Pure Extract of Vanilla." A formula showing imitation character is obscurely placed. "Guaranteed under the Food and Drugs Act."

†No. 4780, certified as "an honest extract of superlative strength, aroma, flavor and keeping qualities. It is the only extract, to my knowledge of which it can be truthfully said it is perfectly pure." This remarkable claim is reinforced by the display upon the label of a bale of vanilla beans.



## ADULTERATED AND MISBRANDED LEMON EXTRACTS.

No.	Brand.	Manufacturer.	Collected of	Lemon Oil percent.	Color.	Remarks.
4271	Extract Lemon.	Carlton Hurd, Newport.	Carlton Hurd, Newport.	4.50	.....	Below standard.
784	Pure Extract Lemon.	McAndrews, Portland, Me.	Elie Chebott, Keene.	4.60	.....	Below standard.
808	Burlington Extract Lemon.	Burlington Extract Co., Burlington, Vt.	L. A. Bean, Claremont.	None	Artificial	Misbranded.
810	XXX Triple Strength Pure Extract Lemon	None given.	John Lynch, Claremont.	None	Artificial	Misbranded.
815	Highly Conc. Extract Lemon.	Howe & Quimby, Claremont.	Howe & Quimby, Claremont.	4.37	.....	Below standard and misbranded.
4329	Finberg's Extract Lemon.	Jos. Finberg, Attleboro, Mass.	Emery Bros. & Co., Suncook.	6.25	Turneric	Art colored with turmeric, not declared on label.
4330	Stone's Extract Lemon.	H. J. Stone Co., Boston.	Emery Bros. & Co., Suncook.	4.37	Artificial	Art. colored. Misbranded.
4332	Manhattan Club Pure Ext. of Lemon	J. H. Folkins & Co., Boston.	M. D. Knox, Manchester.	4.37	.....	Below standard.
4333	Hall's High Grade Ext. Lemon.	Hall Extract Co., Portland, Me.	P. F. Grenier, Manchester.	4.70	Artificial	Below standard.
4334	Hall Brand Extract Lemon.	Prepared at 36 and 38 Brown St., Portland, Me.	S. A. Bates & Co., Suncook.	0.62	.....	Not properly labeled.
4496	Granite State Premium.	Granite State Tea Co., Contoocook.	Submitted from Contoocook.	Trace	Artificial	Misbranded.
4549	Alcono Lemon Flavor (paste).	J. M. Pitkin Co., Newark, N. J.	Submitted from Lakeport.	2.83	.....	Misbranded.
4556	Huffer's Flavor of Lemon.	Germania Medicine Co., Holyoke, Mass.	Spencer Dry Goods Co., Nashua.	None	Artificial	Misbranded.
4557	Eclipse Extract Lemon.	Manufactured at laboratory of J. E. P. Fearing.	F. Newton, Nashua.	0.12	Artificial	Misbranded.
4558	Lemon Flavoring.	Le Lealol Prep. Co., Melrose, Mass.	F. Newton, Nashua.	None	Artificial	Misbranded.
4559	Kellogg's Extract Lemon	F. P. Adams & Co., Boston.	Poor's Market, Manchester.	7.3	Artificial	Added color not declared.
4561	Leighton's Pure Extract	R. G. Leighton, Portland, Me.	Annis F. & G. Store, Nashua.	5.3	Artificial	Added color not properly declared.
4783	Charter Oak Lemon.	Hartford Extract Co., Hartford, Conn.	C. P. Carroll, Portsmouth.	4.8	Natural	Below standard.
4784	Crompton's Bay State Lemon.	None mentioned.	Cater & Benfield, Portsmouth.	0.3	Artificial	Misbranded.
4924	Pure Conc. Extract Lemon.	J. R. Marchand, Berlin Mills.	J. R. Marchand, Berlin Mills.	6.0	.....	Sample not "concentrated."
908	Bulk.	.....	Submitted from Manchester.	0.6	.....	Below standard.
5058	Green Mountain.	C. H. Eddy & Co., Brattleboro, Vt.	Earl Warren, Westmoreland.	0.5	.....	Misbranded.

## BAKING POWDERS.

Thirteen samples were examined. Two of these were improperly branded and were classed as illegal. While the character of the raw materials in baking powders differs greatly in value and while there is also some choice as regards healthfulness, yet practically all of this article now on sale is plainly labeled so as to show its composition. The requirement of ten per cent. of available gas is being uniformly met.

## BOTTLED SODA AND TONICS.

Considerable improvement has been noted in the labeling of these goods, most of them now being branded for just what they are. In a few cases bottlers have been found who failed to use any side-labels on their bottles but depended upon the statement: "artificial color and flavor" appearing in very fine print upon the cap, as being a sufficient notice of the imitation character. In the worst case of misbranding and adulteration encountered, the manager of the company made a personal visit, submitted new labels for our approval and has promised that his goods shall give us no further trouble.

## CELERY SALT.

Of the four brands examined two were classed as illegal, one of these because of adulteration with a large amount of starch, the other because of the insufficient declaration of such an addition.

## COFFEE AND COFFEE SUBSTITUTES.

Seven samples were examined, of which five failed to satisfy requirements, one representing an ordinary coffee containing an excessive amount of dirt and refuse. Two of these were of the now defunct "Digesto" brand of alleged detannated and caffein-less coffee. With one exception all of these alleged hygienic coffees have finally been driven off the market. The notable exception is the "Cafe des Invalides," packed by S. S. Pierce Company, Boston, Mass. According to the claims of this company, an "antidote" has been added to the coffee which effectually counteracts all of the bad effects ordinarily noted in connection with the habitual use of coffee. While our examination did not go further than to show an admixture of chicory, the packers claim the presence of other constituents, although they refuse to state their character but do admit that they are common articles used in everyday cookery, not of the character of drugs and

that they cannot explain why such articles should have an antidotal effect, but only know that they do have such effect. Upon this company being notified of our finding in the matter, it replied by personal visit of attorney. The latter admitted that the federal government has a prosecution pending against this product and submitted a brief showing the line of defense. This would seem to consist (a) of an exposition before a jury of the good name and fame of the S. S. Pierce Company, and (b) of the testimony of some dozens of more or less prominent witnesses who would appear and declare that they could use this coffee without experiencing any ill effects.

It is almost unnecessary to suggest that similar testimony could be adduced with regard to the virtues of the most notorious and worthless of patent medicines, provided only that the latter was extensively advertised or sold and the user's imagination was in a sufficiently receptive state. The company claims that it sells upwards of 100,000 pounds annually of this coffee and as the "antidote" claim nets it a premium of ten cents per pound over the cost of the best grades of coffee, it can well afford to go to extraordinary lengths to defend the sale of this product.

#### COCOAS.

Eighteen samples, representing practically all of the brands appearing upon the local market, were examined. In connection with these analyses special attention was given to the comparative solubilities of the various brands in water at different temperatures, and, incidentally, to their miscibility, or capacity of remaining in suspension in hot water — this for the reason that there seemed good ground for questioning the propriety of the term "soluble," so commonly applied to cocoas.

The cocoa bean is found in the seed-pods of the cocoa tree (*Theobroma cacao* L.). Following their removal from the pod, or fruit, the seeds are allowed to ferment for a day or so, after which they are dried and packed for shipment. The importing cocoa manufacturer subjects these seeds to a very careful roasting, whereby flavor and aroma are developed. After crushing and winnowing out the shells, the "nibs" are ground to a pasty mass, which solidifies on cooling and which is known as chocolate.

In order that this oily paste might be more readily miscible with hot water and afford a more homogeneous liquid on boiling, it was at one time a common custom to add to the product a considerable propor-

tion of sugar, or starch, or both. It was in this practice,—in reality nothing less than adulteration,—that the term “soluble cocoa” has its origin. The present practice in the preparation of breakfast cocoa is to remove about one half of the fat by hydraulic pressure, thus permitting the resulting product to be ground very finely, a condition most essential for the proper incorporation of the powder with boiling water. In addition, some manufacturers of so-called “soluble cocoa” subject the powder to a treatment with alkali, whereby the fatty matter undergoes incipient saponification, the object being to secure a higher degree of miscibility with water. While the following results do show that the latter is thus attained in considerable degree, there is no evidence of any appreciable increase in actual solubility.

Such an emulsification, or blending with hot water does not constitute true solution. While the actual solubility in water is dependent in some degree upon the amount of fat present, the investigations here reported tend to show that in most cases less than one fifth of cocoa powder is soluble in cold water, while even on boiling for three minutes, less than one fourth of the cocoa is actually dissolved.

So far as the nutritive value is concerned, therefore, claims based upon solubility can have no weight; neither is it conceivable that a difference in the latter of a mere three or four per cent. can of itself have any material bearing upon the palatability or flavor. The latter is in far greater degree dependent upon the variety and quality of the cocoa beans and especially upon the care and skill with which they are handled throughout their preparation.

Other things being equal, the ideal cocoa is that which is the most perfectly miscible with boiling water and which deposits the minimum of sediment on standing for a brief time. That a very large proportion of the powder used in the preparation of this beverage would be eventually deposited upon the bottom of the cup is a fact familiar to anyone who has attempted to make so-called “instantaneous” cocoa, in the preparation of which actual boiling has been omitted. Even after the three or four minutes’ boiling invariably essential to the preparation of a smooth, well-blended cup, the proportion of sediment that will deposit on standing is very considerable, and this is true even of the so-called “soluble” cocoas made by the Dutch process.

That the alkali-treated cocoas, however, have some advantage in this respect over the sort depending for miscibility upon fineness of grinding and partial removal of fat is evident from a consideration of the last column of figures presented in the accompanying table of analyses. These figures, designated as the “comparative rate of



sedimentation," represent the relative volumes of sediment which unit weights of the different brands of cocoa, when treated with boiling water, were found to deposit in a given time. In determining these values exactly identical conditions as to proportions, time, and manner of procedure were carefully observed.

No. 878. *Benefit Brand Breakfast Cocoa*. Direct Importing Company, Boston. Said to be "manufactured by a special process which . . . renders the cocoa treble the strength of that ordinarily sold." This statement is untrue, and the product is further held as misbranded because of the claim made for solubility.

No. 896. *Ragus Breakfast Cocoa*. Ragus Tea and Coffee Company, New York. Misbranded because of the claim that it "will be found double the strength of ordinary grades of cocoa." The sample received was found to be short in weight.

No. 910. *Grand Union Cocoa*. Grand Union Tea Company, Brooklyn, New York. Passed.

No. 911. *Lowney's Breakfast Cocoa*. Walter M. Lowney Company, Boston. Passed.

No. 912. *Wilbur's Breakfast Cocoa*. H. O. Wilbur & Sons, Philadelphia. Passed.

No. 913. *Baker's Broma*. Walter Baker & Co., Dorchester, Mass. Represented as being a "combination of the Cocoa-Nut with other ingredients, innocent, invigorating, and agreeable . . ." The analysis shows this product to contain over twenty per cent. of cane sugar and a large proportion of arrowroot starch. Notwithstanding the dilution with these much cheaper substances and the fact that three times the usual quantity is specified to be used, this preparation retails at the same price as pure cocoa. In view of the large admixture of other substances, the display upon the outside of the package of a representation of some cocoa-pods is of questionable legality.

No. 914. *Runkel's Pure Breakfast Cocoa*. Runkel Bros., New York. Represents that the removal of the excess of oil "renders the powder perfectly soluble in hot water or milk and increases the strength three-fold as compared with chocolate or similar preparations containing sugar, starch or arrowroot." This statement is untrue and misleading. The can is made with a raised bottom, thereby giving the package a fictitious appearance of size.

No. 915. *Berry, Dodge Company's Cocoa*. Berry, Dodge Company, Newburyport, Mass. The analysis indicates this to be an alkali-treated cocoa. Passed.



No. 916. *Cloverdale Extra Quality Breakfast Cocoa*. The Cloverdale Company, Boston. Passed.

No. 917. *Huyler's Cocoa*. Huyler's, New York. Misbranded because of claim for solubility.

No. 5075. *Phillips' Digestible Cocoa*. Charles H. Phillips Chemical Company, New York. Instead of removing the fat, as is usually done, the manufacturers of this brand claim, while retaining this element, to have increased its digestibility by "the admixture of a suitable proportion of pancreatin, phosphates and sugar." Investigation fails to show any evidence whatever of the presence of either pancreatin or added phosphates. Cane sugar, however, was found to the extent of over thirty per cent. In the labeling of another package, evidently of somewhat later date, the manufacturers have evidently deemed it best to omit the reference to the presence of pancreatin. This sample is held as both adulterated and misbranded, for the reason that, although consisting of very nearly one-third cane sugar, the only reference to which is in some fine print on the back of the can, the principal label not only contains nothing to suggest its compound character but another label on the side of the package represents the contents as being "pure cocoa."

No. 5076. *Baker's Breakfast Cocoa*. Walter Baker & Co., Ltd., Dorchester, Mass. The label represents that the process used is such as to render the product "treble the strength of cocoa as usually prepared." The claim is also made that it "has more than three times the strength of cocoa mixed with starch, arrow-root or sugar." The first of these claims is untrue and the second is misleading, for the reason that it carries the inference that cocoa ordinarily suffers these additions, whereas such is of rare occurrence. The sample is further misbranded on account of the claims for solubility.

No. 5105. *Suchard's Soluble Cocoa*. Ph. Suchard, Neuchatel, Switzerland. The claim that "most of the cocoa butter has been eliminated" is untrue. This brand not only contains more than one half of the fat originally present but this residual portion is greater than the average. The sample is further misbranded, in addition to the claims for solubility, in that it is represented that "all indigestible constituents . . . have been completely eliminated." The claim that "it is free from alkali" constitutes another count for misbranding, in that it is sought to imply by this statement that the product has not been alkali-treated, whereas the analysis indicates the contrary, and that this brand is no freer from alkali than are others similarly treated.

No. 5106. *Bensdorp's Royal Dutch Cocoa, Pure, Soluble*. Amster-

dam, Holland. This is an alkali-treated cocoa. The manufacturers claim that it is of "double strength" and that one-half teaspoonful only is required to a cup. While there can be no such thing as a pure cocoa of "double strength" in an absolute sense (except by the total elimination of fat), still as the analysis does indicate that the rate of sedimentation in the case of this brand is approximately one half that manifested by some of the others, it is possibly true that a cup with standard "body" can be prepared from this brand with one half the ordinary quantity. But it should be borne in mind that the true value of cocoa as a beverage is very largely dependent upon its stimulating and aromatic qualities, and, by boiling, the latter are extractable from any well-ground cocoa with comparative facility. In fact practical cup tests indicate that for the securing of equal flavor and aroma about the same proportions must be used with this brand as with the poorest miscible ones. Misbranded.

No. 5107. *Van Houten's Pure Soluble Cocoa*. C. J. Van Houten & Zoon, Weesp, Holland. Use of alkali suggested by labeling and confirmed by analysis. Represented as being a "highly concentrated cocoa." A circular accompanying introductory samples claims it to be "completely soluble; there is no sediment nor waste, and no boiling is required." The manufacturers elsewhere admit, however, that "unless absolutely boiling water is used, the best results can only be obtained by boiling the cocoa for about three minutes," thus practically admitting that for proper preparation, boiling for this brand is as essential as it is for any other. Misbranded.

No. 943. *Rockwood & Co.'s Semper Idem Breakfast Cocoa*. Rockwood & Co., New York. Improperly represented as being an "Extract of Cocoa." Misbranded.

Following the above report, which appeared in the issue of the *Bulletin* for April, 1910, an extensive correspondence ensued between this office and various manufacturers of cocoa. Most of the latter sought to deny the truth of the contentions set forth in the above and one of these (the Van Houten Company) submitted an elaborate and wordy printed brief (in itself an admission that they had before been called upon to defend and justify their labeling) containing the testimonials of various Continental chemists and physicians. The manufacturers of the Bensdorp brand, however, have adopted a different course. The matter was at once taken up by the local importers with the Holland manufacturers with the result that we have recently been informed that the latter have decided to accede to the points made in the above report and the label which they submit and claim they will henceforth use has been shorn of all objectionable language.

## RESULTS OF THE EXAMINATION OF COCOA.

No.	Brand.	Net weight claimed, oz.	Net weight found, oz.	Price per can, cents.	Equivalent cost per pound, cts.	Total ash, per cent.	Insoluble ash, per cent.	*Alkalinity of ash.	Fat, per cent.	Refraction of fat at 40° C.	Fiber, per cent.	Direct polarization.	Cane sugar, per cent.	Added starch.	Soluble in cold water, per cent.	Soluble at 65° C., per cent.	Soluble in boiling water, per cent.	Comparative rate of sedimentation.
878	Benefit.....	8	3.9	9	37	5.00	3.50	4.2	23.10	47.6	4.30	0	0	0	20.4	22.1	25.3	82
886	Ramus.....	8	46.7	20	48	5.40	3.60	5.5	23.00	47.3	4.50	0	0	0	19.3	21.3	24.0	97
910	Grand Union.....	8	8.2	25	49	5.40	3.45	4.4	24.25	47.5	4.45	0	0	0	19.9	21.6	23.2	80
911	Lowrey's.....	8	7.7	25	52	5.40	3.60	5.0	22.75	47.5	4.50	0.8	0	0	20.7	22.2	24.8	86
912	Wilbur's.....	8	8.2	25	49	4.55	2.45	4.2	30.15	47.1	3.75	0	0	0	17.0	19.2	21.0	98
913	Baker's Broma.....	8	3.0	25	50	1.45	1.00	2.0	26.05	47.0	1.10	24.0	22.5	large	38.1	21.5	40.7	98
914	Runkel's.....	3.2	3.5	10	46	5.50	3.65	4.9	24.15	47.4	3.85	1.2	0	0	19.7	22.8	24.4	98
915	Berry, Dodge.....	3.4	3.4	10	47	7.85	1.95	9.7	23.00	47.5	3.55	1.0	0	0	21.6	24.0	24.2	61
916	Cloverdale.....	4.0	4.0	10	40	5.40	3.20	6.1	23.70	.....	.....	1.2	0	0	20.1	22.0	24.2	81
917	Huyler's.....	8	4.0	25	50	4.90	3.15	5.4	27.50	.....	.....	0	0	0	18.0	19.5	21.1	87
5075	Phillips.....	8	8.0	25	38	2.65	1.55	3.3	32.40	.....	.....	32.0	30.7	0	43.7	20.6	45.7	180
5076	Walter Baker's.....	8	8.2	23	45	5.15	3.30	5.4	27.75	.....	.....	1.2	0	0	19.0	20.6	21.8	110
5105	Suchard's.....	4	4.4	25	91	7.00	2.10	7.8	32.05	.....	.....	0.4	0	0	17.7	19.7	23.8	49
5106	Bensdorf's.....	8	8.0	35	70	6.50	2.20	7.5	28.55	.....	.....	0	0	0	17.7	20.2	24.7	48
5107	Van Houten's.....	8	2.7	15	90	8.10	1.65	8.0	29.50	.....	.....	3.2	0	0	19.8	20.8	23.7	58
943	Rockwood's.....	8	7.7	25	52	6.07	4.22	5.7	20.55	.....	.....	0.8	0	0	20.9	25.5	25.9	80

\* cc. of n-10 alkali for 1 gram cocoa, using methyl orange.

† A second package was found to contain 7.25 ounces.

‡ Corrected for cane sugar content.

## CIDER.

Of the thirteen samples of sweet cider examined, five were found to contain added preservatives, that in two cases being salicylic acid, with benzoic acid in the other three. Most of these were sold by Manchester vendors. The salicylic acid cases were prosecuted.

## CANNED MEATS.

Three samples of canned meats were received, all of which were found to be of good quality and correctly labeled. The net weight stated upon the cans in each case was found to be the true one.

## FISH.

Fifteen samples, mainly representing canned sardines, were examined. The analysis was directed toward determining the truth of the claim that the goods were packed in olive oil. In one instance only was any ground detected for disputing this claim, and the evidence in this case was not satisfactorily conclusive.

## HONEY.

Eight samples were examined, none of which afforded evidence of adulteration or misbranding.

## MAPLE PRODUCTS.

The samples examined include fourteen of sugar and twenty-two of syrups, the result indicating one of the former and six of the latter as being adulterated or misbranded. The adulterated sugar sample was submitted from a ten-pound can of soft sugar. None of the syrups sold as straight maple were found to be adulterated, the illegal syrup cases consisting of improperly labeled brands of mixed syrups.

## MOLASSES.

Eleven samples of molasses were examined for added glucose, with negative results in each case.

## SPICES.

Twenty-six samples were examined, all but one of which were found to be of standard quality. The varieties examined include: pepper, nine samples; ginger and cloves, three samples; allspice, four samples; mace, two samples; cassia, cayenne and nutmeg, one sample of each.



## OYSTERS.

On September 15, 1909, the following order was issued:

## NOTICE TO DEALERS IN OYSTERS.

The addition of water to shucked oysters, by both packer and retailer, is a practice that has long been recognized as of rather common occurrence. A still more frequent practice is to be found in the shipment to the retailer of oysters refrigerated in the shipping package by the direct addition of ice.

In their proper character shucked oysters consist principally of the solid (unbloated) meat, and the proportion of liquid should be small. It is obvious that the addition of either water or ice must result in a dilution necessarily involving a lowering of the quality. The first is solely for purposes of fraud, while the second not only materially inflates the volume of the product but is unsanitary, as well as wholly unnecessary.

Ice packed around the container holding the oysters, in shipping cans made for that purpose and which are largely used in many localities, secures the necessary refrigeration.

At a regular meeting of the State Board of Health, the following resolution was therefore adopted:

WHEREAS, Since the addition of water or ice to shucked oysters has the effect of lowering, depreciating and injuriously affecting their strength, quality and purity, therefore be it

*Resolved*, That as such condition constitutes an adulteration under the Statutes of the State, the sale of oysters so adulterated will be contested.

Dealers are hereby instructed not to accept oysters to which water or ice has been added, and they are cautioned not to add ice to oysters nor to dilute them with water.

Per order,

IRVING A. WATSON,

CONCORD, N. H., September 15, 1909.

*Secretary.*

The response on the part of the dealers to the order issued September 15 last, relative to the shipment and handling of oysters, has proved to be quite prompt, and most gratifying results are already noticeable. One year ago almost no oysters were being received in double packages, icing by direct contact being the rule. At the present time, our inspection has thus far failed to reveal a single instance where the latter is being practised. Moreover, the amount of liquid, *i. e.*, water, present in oysters as on sale today has very greatly decreased over that noted in the past. The consumer is,



therefore, not only receiving the benefit of better and more sanitary methods of handling, but he is getting more oysters for his money. Very much of the credit for this is due to the jobbers, without whose active coöperation doubtless but little could have been accomplished in this brief time. In fact, that the former method of shipment will soon be a thing of the past is evident from an order recently issued in this connection by the Federal Board of Food and Drug Inspection, which becomes effective May 1 of this year.

No official standard for the amount of water permissible has as yet been fixed. It should be understood that oysters are washed after shucking, so that the liquid mixed with them as they come to the consumer, does not, as is frequently supposed, represent the natural liquor. Furthermore, if "bloating" or "drinking" in fresh water has been practised, the proportion of solid matter in the meats will be appreciably diminished, as a result of the abnormal swelling in volume. Pending the adoption of a standard, this department will hold a water content representing free liquid in excess of 17 per cent. or total solids less than 10 per cent., as excessive. That this is a liberal margin is evident, not only from investigations made elsewhere, but from the results shown in the following table. These data indicate a range in free liquor content of from 2.3 per cent. to 37 per cent., with an average of 13.3 per cent. Forty per cent. of the samples contained less than 10 per cent. free liquor. But one sample contained less than 10 per cent. total solids, the highest content being 21.9 per cent., with an average of 15.4 per cent. Approximately 70 per cent. of the samples showed a total solid content of 15 per cent. or over. The prices charged ranged from thirty-five cents to fifty cents per quart, and in general there is but little apparent relation between price and quality.

None of the samples received were found to contain any added preservative. The following table gives the results of examination of some of the samples received during the past two years:

## EXAMINATION OF OYSTERS.

No.	Dealer.	Price per quart.	Free liquor %.	Total solids %.
4855	Submitted from Concord.....	\$0.35	6.0	.....
4944	Jameson Fish Market, Concord .....	.....	21.2	10.9
4945	Philbrick Fish Market, Concord.....	.35	25.1	13.0
4949	John E. Berry, Concord.....	.40	28.6	9.7
4952	Nolan & Corbett, Concord.....	.45	20.1	15.1
4951	James Martin, Concord.....	.45	19.0	15.1
4950	Gale & Brown, Concord.....	.....	8.3	15.4
4953	H. H. Chamberlin, Concord.....	.40	6.5	16.3
4954	Lyster Brothers, Concord.....	.40	12.2	16.3
4960	G. B. Whittredge, Concord.....	.45	9.8	15.6
4961	Concord Cash Market, Concord.....	.40	28.3	12.4
4962	C. F. Bunker, Concord.....	.45	16.3	17.4
4963	A. F. Heath, Concord.....	.50	5.0	21.9
4964	A. L. Maher, Concord.....	.45	25.2	14.4
4965	H. H. Crockett, Concord.....	.....	13.8	14.4
4971	C. D. Steele, Manchester.....	.40	11.0	17.8
4972	Twentieth Century Market, Manchester.....	.40	21.0	11.5
4973	C. E. Newcomb, Manchester.....	.40	11.0	17.1
4974	Annis Flour & Grain Co., Manchester.....	.40	11.0	17.0
4993	E. S. Newton, Manchester.....	.....	11.0	13.0
4994	Gorman Brothers, Manchester.....	.45	19.0	18.9
4995	G. T. Robinson, Manchester.....	.35	13.0	15.2
4996	E. C. Voisand, Manchester.....	.45	19.0	15.0
5023	A. D. Prince, Manchester.....	.40	25.0	16.6
5026	Wiggin, Young & Co., Manchester.....	.40	8.0	14.6
5027	Lamoureux Brothers, Manchester.....	.40	14.0	19.1
5028	Annis Flour & Grain Co., Manchester.....	.40	2.7	18.6
5024	Dumas & Prince, Manchester.....	.40	37.0	12.5
5075	E. Quirin, Manchester.....	.40	23.0	12.7
5032	Cortland Provision Co., Dover.....	.....	2.3	19.3
5033	H. D. Philbrick, Dover.....	.....	5.2	15.8
5034	E. H. Gowen & Son, Dover.....	.....	9.2	14.7
5035	Colbath Brothers, Dover.....	.....	6.6	16.5
5036	Eben Berry, Dover.....	.....	3.1	18.9
5037	Globe Market, Dover.....	.....	2.5	15.7
5038	Gray's Grocery, Dover.....	.....	6.6	19.1
5039*	Clement's Restaurant, Dover.....	.....	23.7	20.4
5040	People's Market, Dover.....	.....	9.8	16.5
5041	R. A. Newton, Portsmouth.....	.....	11.4	14.1
5042	John Holland, Portsmouth.....	.....	5.6	18.7
5043	John O. Downs, Portsmouth.....	.....	6.1	16.8
5044	Kershaw & Hodgdon, Portsmouth.....	.....	14.6	17.6
5045	John McIntyre, Rochester.....	.....	8.9	15.8
5046	F. R. Adams, Rochester.....	.....	10.1	13.5
5047	Joseph Norris, Rochester.....	.....	19.8	13.3
5048	J. C. Hurd, Rochester.....	.....	7.1	17.1

\* Shell oysters. Natural liquor.

## GRAPE JUICE.

Twelve samples, representing eleven different brands of grape juice, were submitted to a complete analysis. With one possible exception, there is reason to believe that all of these represent the genuine, undiluted juice of the grape. Some of the samples, however, were much more cloudy, and showed more sediment than others, and while a certain amount of cloudiness seems unavoidable in the pure, untreated article, yet it is apparent that, in one or two cases, an excess was attributable to undue extraction of seeds and skins. One sample contained added cane sugar, the presence of which, not being declared upon the label, must be regarded as an adulteration. While most of the samples contained no more than the merest traces of alcohol, or none at all, one brand is classed as adulterated and misbranded because of the presence of 0.83 per cent. of this compound. Considerable variation in the amount of acid is noticeable, the latter being in greatest amount in the white juices.

No. 5163. *Walker's Grape Juice*. Grape Products Co., North East, Pa. "The brand that raised the standard." This product has of late been extensively advertised, the principal claims for its purity being based upon the absence of any opacity and the alleged complete absence of tannin or other astringent substances. Examination, however, shows not only that it is the thinnest of any of the juices examined, but that it does contain tannin in appreciable quantity. Of two samples examined, both were found to be materially short of the volume claimed. Misbranded.

No. 5164. *Welch's Grape Juice*. Welch Grape Juice Co., Westfield, N. Y. Passed.

No. 5176. *Duffy's Grape Juice*. Sterilized 1842. Non-alcoholic. Unfermented. American Fruit Products Co., Rochester. Contains an unnecessary amount of alcohol for a pure, carefully made product. Held as adulterated and misbranded.

No. 5175. *Randall's Gold Medal Brand*. Chatauqua Fruit Co., Ripley, N. Y. "It makes new blood." The sample received showed an excessive amount of opacity and sediment, and the proportion of sugar in the solids is the lowest of any of the unsweetened juices.

No. 5176. *Bass Islands Unfermented Catawba Grape Juice*. Bass Islands Vineyards Co., Sandusky, Ohio. Short of volume claimed. Misbranded.

No. 5186. *Indian Head Irondequoit Unfermented Grape Juice*. Irondequoit Fruit Juice Co., Rochester, N. Y. Passed.

No. 5192. *Meier's Grape Juice (Catawba)*. John C. Meier Grape Juice Co., Silverton, Ohio. Represented as containing 0.034 per cent. of sulphurous acid. Through the use of the latter compound this product has been bleached almost to whiteness. It is questionable if a product thus treated is a suitable article for "the sick and convalescent," as claimed. The use of sulphur dioxide as an antiseptic, whether declared upon the label or not, is illegal in New Hampshire. Adulterated.

No. 5194. *Naboth Pure Unfermented Concord Grape Juice*. Naboth Vineyards, Brocton, N. Y. Contains added cane sugar, not declared. Adulterated.

No. 5195. *Princess Indian Head Brand Grape Juice (Catawba)*. Irondequoit Fruit Juice Co., Rochester, N. Y. Passed.

No. 1122A. *Fenner's Chatauqua Grape Juice*. Fenner Grape Juice Co., Westfield, N. Y. Passed.

No. 1123A. *Vineland Grape Juice*. Vineland Grape Juice Co., Vineland, N. J. Passed.

RESULTS OF THE EXAMINATION OF GRAPE JUICE.

Number.	Brand.	Manufacturer.	Cost, cents per bottle.	Volume claimed, ounces.	Volume found, ounces.	Specific gravity at 15.5°C.	Extract, grams in 100 c.c.	Alcohol, %.	Total acids, as tartaric, %.	Volatile acids, as acetic, %.	Polarization, undiluted.		Glucose.	Cane sugar.	Reducing sugars, grams in 100 c.c.	Per cent. reducing sugars in extract.	Ash, %.	Alkalinity of soluble ash.	Preservatives.
											a	b							
5163	Walker's.....	Grape Products Co., North East, Pa.	25	16	15.2	1.0609	15.84	Traces	1.07	.03	-19.5	-19.5	0	0	12.45	78.6	.33	25	0
5164	Welch's.....	Welch Grape Juice Co., Westfield, N. Y.	50	32	32.0	1.0750	19.50	Traces	0.81	.....	-21.7	-23.9	0	Slight	15.46	79.2	.39	25	0
5165	Duffy's.....	Am. Fruit Products Co., Rochester, N. Y.	18	....	14.8	1.0627	16.57	0.83	0.93	.02	-20.8	-20.8	0	0	15.20	91.7	.28	20	0
5166	Walker's.....	Grape Products Co., North East, Pa.	25	16	14.6	1.0597	15.48	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5175	Randall's.....	Randall Grape Juice Co., Ripley, N. Y.	25	....	15.2	1.0763	19.81	None	1.27	0.02	-21.0	-21.6	0	0	12.52	63.2	.36	28	0
5176	Bass Islands' Catawba	Bass Islands' Vineyards Co., Sandusky, Ohio	05	4	3.9*	1.0803	20.86	None	1.17	0.02	-26.8	-26.8	0	0	13.68	65.5	.17	16	0
5186	Indian Head.....	Irondequoit Fruit Juice Co., Rochester, N. Y.	25	16	16.0	1.0769	20.02	0.15	0.87	0.02	-28.0	-28.0	0	0	15.49	77.4	.40	28	0
5192	Meier's.....	J. C. Meier Grape Juice Co., Silverton, Ohio	10	....	3.6*	1.0795	20.73	0.15	1.23	.....	-27.0	-27.0	0	0	16.29	78.0	.27	10	Pres- ent
5194	Naboth.....	Naboth Vineyards, Brocton, N. Y.	25	....	16.0	1.0818	21.25	Traces	0.88	0.01	-12.4	-26.8	0	Present	12.72	59.9	.22	16	0
5195	Princess.....	Irondequoit Fruit Juice Co., Rochester, N. Y.	25	16	15.9	1.0843	21.91	None	0.96	0.01	-30.5	-34.0	0	Slight	15.65	71.4	.22	20	0
1122A	Fenner's.....	Fenner's Grape Juice Co., Westfield, N. Y.	10	....	4.0*	1.0768	19.94	None	0.76	0.03	-22.2	-24.0	0	Slight	14.95	74.9	.27	23	0
1123A	Vineland.....	Vineland Grape Juice Co., Vineland, N. Y.	10	....	3.6*	1.0789	20.49	None	1.02	.....	-22.5	-25.4	0	Slight	15.47	75.0	.30	23	0

\* Average of four bottles.

† Stated to contain .034 per cent. of sulphur dioxide; found, .022 per cent.



## TABLE SALT.

Nine brands were examined, of which four represent prepared salt. Two imported brands are included.

The standard of the State and National Food Departments defines table and dairy salt as a "fine-grained crystalline salt containing on a water-free basis not more than one and four-tenths per cent. of calcium sulphate, nor more than five-tenths per cent. of calcium and magnesium chlorides, nor more than one-tenth per cent. of matters insoluble in water."

None of the samples were found to violate the letter of the above requirements, although the sum of the sulphates present in one of the imported brands, if calculated as gypsum, would be considerably in excess of the limit for this constituent. The principal impurity of the New York and Michigan salt is sulphate of calcium (gypsum). Calcium and magnesium chlorides are vigorous moisture absorbents and as the proportion of such compounds in this salt is relatively small, the latter, unlike that produced from the Ohio Valley brines, can be stored in sacks without taking up excessive moisture.

It has long been recognized that if salt be mixed with five to ten per cent. of corn starch the troublesome property of becoming moist in warm weather is obviated. The fact that a smaller admixture of certain other materials will afford the same result now receives extensive commercial application. The compounds noted in these prepared brands are the phosphates and carbonates of lime and magnesia, the proportion used ranging from as little as six tenths of one per cent. to nearly three per cent.

In so far as sentiment may be the ruling cause, the demand on the part of a certain class of consumers for salt from "across the water" will doubtless continue, regardless of considerations of either price or quality. But if the two well-known specimens here reported may be accepted as typical, it would seem that in neither respect can the British product compare with the American. These brands contained the least actual salt of any in the list, while the price was approximately double that for the corresponding American article.

No. 4813. *Purity Salt (prepared)*. International Salt Company, New York. Labeled as containing over 99% of high grade Purity Salt and less than one per cent. of phosphate. The analysis indicates the drier to consist of calcium phosphate in the proportion of 0.626%. Notwithstanding this insignificant amount, the quantity of moisture in this brand is extremely small. While the product is remarkable

in this respect, there are several other salts in the list that show a trifle less of soluble impurities.

No. 4814. *Ivory (Compound) Salt*. Worcester Salt Company, New York. Labeled as containing 99% of high grade table salt, with one per cent. of carbonate of magnesia. The analysis shows that the amount of drier (1.80%) is considerably in excess of this guaranty.

No. 4815. *Extra Refined British Table Salt*. Crosse & Blackwell, London, Eng. Contained in a stone-ware jar. Notwithstanding that this is the most expensive salt sampled, it contained the largest amount of impurities. For this reason the designation "Extra Refined" is held as misbranding.

No. 4816. *Peerless Brand Granulated Salt*. Charles E. Moody & Co., Boston. Packed in bags. The proportion of insoluble matter in this brand is slightly greater than in any of the other plain salts and the solution afforded is the darkest.

No. 4817. *Crystalline Salt*. Crystalline Salt Company, Boston. Packed in bags. The claim on the package that this brand is "entirely free from lime and other impurities found in common salt" is untrue and amounts to misbranding.

No. 4818. *Worcester Brand Salt*. Worcester Salt Company, New York. Packed in bags. Of the three bag samples this gives the whitest solution.

No. 4819. *Shaker Table Salt*. Diamond Crystal Salt Company, St. Clair, Mich. Labeled as containing 1.75% of calcium carbonate as drier. The analysis shows 1.67% of carbonates. A slip attached to the package contains the misleading statement that this is "the only salt in the world over 99% pure." \* It is true, however, that the salt used in the preparation of this brand is the purest of the samples here reported.

No. 4822. *Diamond Crystal Table Salt*. Diamond Crystal Salt Company, St. Clair, Mich. Packed in cartons.

No. 4823. *Prepared Cerebos Table Salt*. Cerebos, Ltd., London, Eng. The carton shows a formula claiming: "Refined table salt, 97.82%; calcium phosphate 1.63%; magnesium phosphate 0.44%; sodium phosphate 0.11%. The analysis shows a somewhat higher proportion of drier than these figures indicate—the amount used being the greatest in any of the prepared samples.

\* Some of the advertising issued by the manufacturers of this brand is open to objection in that it carries the inference that the average brand of table salt contains excessive and dangerous quantities of impurities—an imputation that is not borne out by the facts. Furthermore it should not be forgotten that the manufacturers themselves admit the actual addition to this product for drying purposes of as much as 1.75% of a lime compound.

ANALYSES OF TABLE SALT.

Number.	Brand.	Calculated to water-free basis.										Price per package, cents.	Cost per pound, cents.
		Moisture. Per cent.	Calcium sulphate. Per cent.	Calcium chloride. Per cent.	Magnesium sulphate. Per cent.	Magnesium chloride. Per cent.	Sodium sulphate. Per cent.	Insoluble matter. Per cent.	Total soluble impurities. Per cent.	Pure salt. Per cent.			
4815	Extra Refined British (jar).....	.000	1.100	.000	.042	.000	1.464	.028	2.606	97.400	20	9.7	
4816	Peerless (bag).....	.910	.992	.166	.000	.052	.000	.048	1.210	98.742	5	2.0	
4817	Crystalline (bag).....	.810	.940	.070	.000	.012	.000	.014	1.022	98.964	5	2.0	
4818	Worcester (bag).....	.390	.994	.000	.000	.030	.000	.025	1.024	98.950	10	2.0	
4822	Diamond Crystal (carton).....	.027	.410	.000	.012	.007	.000	.010	.429	98.560	10	3.0	

ANALYSES OF PREPARED TABLE SALT.

Number.	Brand.	Calculated to water-free basis.										Price per package, cents.	Cost per pound, cents.	
		Moisture. Per cent.	Calcium sulphate. Per cent.	Calcium chloride. Per cent.	Magnesium sulphate. Per cent.	Magnesium chloride. Per cent.	Sodium sulphate. Per cent.	Insoluble matter. Per cent.	Total soluble matter. Per cent.	Total soluble impurities. Per cent.	Actual salt present. Per cent.			Purity of salt used in mixture. Per cent.
4813	Purity.....	.090	1.062	.058	.000	.048	.000	.626	99.370	1.168	98.206	98.830	10	4.3
4814	Ivory.....	.560	.493	.247	.000	.247	.000	1.800	98.200	1.370	96.830	98.500	10	5.0
4819	Shaker.....	.050	.204	.017	.000	.017	.000	1.670	98.380	.291	98.049	99.710	10	4.7
4823	Cerebos.....	.185	.646	.000	.189	.000	.189	2.905	97.095	1.060	96.035	98.913	12	8.7

## EXAMINATION OF DRUGS AND PROPRIETARIES.

The following summary shows the results in this connection:

	Total.	Not conformable.
Camphorated oil.....	6	5
Lime water.....	10	3
Milk Sugar.....	13	2
Precipitated sulphur.....	5	1
Spirits camphor.....	11	7
Spirits anise.....	21	6
Spirits peppermint.....	23	17
Spirits wintergreen.....	13	9
Tincture iodine.....	15	8
Proprietaries and miscellaneous examinations	84	..
Totals.....	201	58

## CAMPHORATED OIL.

The pharmacopœial requirement is 20 per cent. of camphor. Very few of the preparations on sale have been found to contain as large an amount of camphor as this. The products of this description to be found at the grocery stores are on nearly every case deplorably deficient. Even in the case of the druggists' preparations the results are far from satisfactory. Some druggists, it might seem, are of the opinion that ten per cent. of camphor is sufficient, or it is conceivable that in some cases the druggist may confuse the requirement for this product with that of the spirits of camphor, which is ten per cent.

## PRECIPITATED SULPHUR.

But one sample of adulterated precipitated sulphur was received and this doubtless represented old stock. There has been a very marked improvement made in the character of this drug of late.

## MILK SUGAR.

There seems to be an impression, doubtless based upon formerly existing conditions, that milk sugar is an article peculiarly liable to adulteration. Physicians are apparently skeptical as to the fitness for milk modification of the lower priced brands and, according to statements coming to our notice, as much as sixty cents a pound is sometimes charged for an article presumed to be of exceptional quality. The list here presented includes practically all of the better known



brands upon the market. The price paid was from twenty-five cents to forty cents per pound. In no case was gross adulteration detected—such as with cane-sugar, starch, glucose or excess of albuminoids. But one sample failed to comply with the requirements of the Pharmacopœia, in this case there being an excessive amount of mineral matter.\* Some of these brands were much better than others, however; that is they were cleaner, freer from lint, dust and odors and small residues of albuminoids and mineral matter. A point of some interest in connection with these examinations is in the fact that while the lowest priced brands proved to be somewhat inferior, contrary to what might be expected, some of the better known brands—those usually selling at a premium—were not only found to be no better in any respect than the majority, but were not so good even. That a well-packed article of excellent quality can be produced to sell at a moderate price is evident from the following analyses:

No. 4461. Milk Sugar in bulk; Powers-Weightman-Rosengarten Company.

No. 4462. Patch's Powdered Milk Sugar, E. L. Patch Company, Boston.

No. 4480. Milk Sugar, Merck's, highest purity, powdered; E. Merck & Co., New York.

No. 4500. Squibb's Milk Sugar, E. R. Squibb & Sons, New York.

No. 4502. Powdered Sugar of Milk, Schieffelin & Co., New York.

No. 4503. Rexall Sugar of Milk; United Drug Company, Boston. "A chemically pure and sterile product;" guaranteed free from all adulterants, etc.

No. 4505. Sugar of Milk; Billings-Clapp Company, Boston.

No. 4506. Sugar of Milk; U. S. P., Powers-Weightman-Rosengarten Company, Philadelphia.

No. 4507. Milk Sugar in bulk.

No. 4636. Wyeth's Pure Powdered Milk Sugar; John Wyeth & Brother, Philadelphia.

\* A second sample of the Rexall brand, purchased July 15, 1910, of A. J. Precourt & Co., Manchester, was found to have an ash content of 0.84%. This sugar is sold under guaranty No. 238 and is represented as being "absolutely free from impurities."



## RESULTS OF EXAMINATION OF MILK SUGAR.

Number.	Brand.	Container.	Net weight, ozs.	Price per lb., cents.	Total ash, per cent.	Total sediment, per cent.	Mineral sediment, per cent.	c. c. $\frac{10}{N}$ alkali required for 100 gms.	Cane sugar.	Glucose.	Starch.	20 per cent. solution in hot water shows:				Remarks.
												Color.	Turbidity.	Sediment.	Cloud with 1 c. c. acid mercuric nitrate solution.	
4461	Powers & Weightman.....	Bulk.	...	35	0.25	.035	.006	5.0	0	0	0	None	V. slight	Slight	Slight	Standard.
4479	Patch's.....	Tin.	16.0	35	0.01	.017	.005	1.5	0	0	0	None	None	V. slight	V. faint	Standard.
4480	Mercé's.....	P. bd.	15.3	35	0.03	.026	.006	2.5	0	0	0	V. slight	Slight to moderate	Slight	Slight	Standard.
4500	Squibb's.....	Tin.	16.0	40	0.18	.041	.022	3.0	0	0	0	None	Slight	Slight	Slight	Standard.
4502	Schiffelin's.....	P. bd.	16.7	35	0.02	.015	.....	3.0	0	0	0	V. slight	Slight to moderate	V. slight	Slight	Paint odor of toilet soap.
4503	Rexall.....	P. bd.	15.9	25	0.49*	.032	.007	2.0	0	0	0	None	moderate	Slight	Faint	Ash in excess of legal limit.
4504	Patch's.....	Tin.	16.0	35	0.02	.....	.....	1.5	0	0	0	None	None	V. slight	V. faint	Standard.
4505	Billings, Clapp.....	Tin.	16.9	35	0.19	.014	.....	3.0	0	0	0	Slight	None	Slight	V. faint	Standard.
4506	Powers & Weightman.....	W. box.	15.8	35	0.02	.014	.002	2.0	0	0	0	None	None	V. slight	V. faint	Standard.
4507	Bulk.....	.....	...	35	0.02	.012	.....	2.0	0	0	0	V. slight	None	V. slight	V. faint	Standard.
4508	Mercé's.....	P. bd.	15.9	35	0.02	.023	.....	3.0	0	0	0	V. slight	Slight to moderate	Slight	Slight	Standard.
4636	Wyeth's.....	P. bd.	16.1	25	0.20	.....	.....	3.7	0	0	0	V. slight	moderate	Slight	Considerable	Odor of toilet soap; relatively appreciable albuminoid content.

\*Soluble ash 0.33 per cent., mainly gypsum.

## SPIRITS OF ANISE.

The requirement is ten per cent. of oil of anise. Of the twenty-one samples of this preparation received, six were found to be deficient. One of these samples, submitted from Keene, was found to contain less than five per cent. of oil. The other deficient samples showed 8.6, 8.7, 8.6 and 6.5 per cent. of oil respectively. This may be accepted as a very satisfactory condition, especially in view of the fact that extensive deficiencies in this preparation have recently been discovered in other states and nothing has hitherto been done in this connection in this state.

## SPIRITS OF CAMPHOR.

Most of the seven preparations found deficient represented samples purchased at grocery stores.

## SPIRITS OF PEPPERMINT AND WINTERGREEN.

The preparations of this description dispensed by druggists are for the most part either up to standard or deviate from such but slightly. As usual, the grocery store products are the offenders. A few of these, while probably really designed for the most part for flavoring purposes, were classed as adulterated or misbranded because of improper labeling. No. 4370, Solar Brand Essence of Peppermint, put up for C. A. Weston & Co., Portland, Me., bore a formula claiming:

"Oil peppermint 3m, 50% alcohol, 1 oz." This is an example of a type of "essence" put up by a well-known Portland extract manufacturer. These preparations are not handled by druggists, and the formula, not being intelligible to either dealer or consumer, is not proper notice that the article is less than one fifteenth of standard strength. Notwithstanding this, the price is identical with that usually charged for the latter. Whether or not the allegation is true that the principal use of these preparations is as a beverage, the fact remains that their composition is such as to fit them for this purpose, and for very little else.

## TINCTURE OF IODINE.

Of the fifteen samples received, eight were found to contain less than the required amount of iodine. In but one case was the deficiency an appreciable one, this preparation, put up by C. H. Eddy & Co., Brattleboro, Vt., containing but 61 per cent. of the required amount.

## PROPRIETARIES AND MISCELLANEOUS.

---

### A. D. S. HEADACHE WAFERS.

A ten-cent package contains four wafers, each represented as carrying four grains of acetanilide. The analysis shows this to be correct, the other constituents being milk sugar and caffeine. While the preparation differs in no essential from the numerous other preparations of this kind on the market, yet the accompanying reading matter is designed to lead the user to believe that the above is "perfectly safe," as, unlike the ordinary variety, it is alleged to "cure the head without injuring the heart." Manufactured by American Druggists' Syndicate Company, New York.

### NATURE TISSUE TABLETS.

According to the statement upon the package, these tablets "supply the waste and degeneration of tissue and arrest the decay and failing of old age. These are a tissue food and not a medicine. They give strength and tone to the entire system and prevent disease. They are used in liver, stomach and kidney troubles, and should be taken where there is any breaking down of the tissues." Manufactured by the Toxo-Absorbent Company, Rochester, New York. The above represents one of the baldest kinds of false claims conceivable. These tablets are in no sense a food and they cannot possibly do the things claimed for them. The manufacturer gives a dissertation upon the value of "getting back to earth," and the conclusions that he draws as to the benefits of dirt-eating are skilfully calculated to redound to his advantage. To be sure, common earth is cheap enough, but this will not serve because it is not pure, whereas the Toxo-Absorbent product is specially taken from the bowels of the earth, where all matter is necessarily in a sterile, uncontaminated condition.

The analysis shows about 50% of a clayey earth, mixed with about 10% of carbonate of magnesia, some charcoal, and an aromatic of the nature of a carminative.

### OBESITY TABLET.

Dr. F. J. Kellogg's Obesity-Reducing Tablets. "A safe fat reducer." Guaranteed under the Food and Drugs Act, by F. J. Kellogg, Battle

Creek, Mich. This preparation seems to consist principally of cooked starch, apparently wheat. Examinations were made for arsenic and for other substances of a deleterious nature, with negative results. It is difficult to understand how the preparation can accomplish what is claimed for it.

#### Diozo.

Prepared by the Parker Chemical Company, Chicago. Consists of a tin box with perforations and designed to hang up on the wall; sells for fifty cents. The apparatus is represented as "constantly throwing off minute crystals which ozonify and purify the air." This is a misstatement, so far as the ozonification is concerned, although it does undoubtedly give forth infinitesimal traces of vapor sufficient to produce a distinct odor. Also represented as destroying "microbes and disease germs. Prevents spread of contagion, imparts a refreshing and healthful odor to the sick room, and is most beneficial in relieving colds, whooping cough, croup, asthma, bronchitis, catarrh, diphtheria, lung trouble."

These claims are too strong by far. The contents of the box consist of a half pound cone composed of a crystalline mass of crude naphthalene—one of the higher distillates from coal-tar containing beside naphthalene, small proportions of carbolic acid and allied bodies. While it is known that such products do tend to volatilize slightly on exposure to the air, nevertheless the claims made for this article are in general of a decidedly misleading character and druggists and others are therefore warned that the present labeling is in violation of the Food and Drugs Act.

#### STRAW'S ODOR-NO.

A liquid disinfectant prepared by the Odor-No Chemical Company, Boston, Mass. Sells for 50 cents per bottle. Is a colorless, nearly tasteless, non-corrosive liquid, exhibiting a very faint odor suggestive of perfume. Represented as a non-poisonous agent for the destruction of germs and odors, also to be used as a douche for the cure of sore-throat and leucorrhœa, and as a spray for purifying the atmosphere of sick-rooms, schools, churches, etc. The manufacturers submit a certificate from a bacteriologist testifying to the efficiency of this preparation as a germicide.

The analysis shows this product to consist of about one per cent. of boracic acid, less than one half per cent. of formaldehyde and three per cent. of alcohol. While there is no doubt that such a preparation



will do what is claimed for it, nevertheless the public should not be unwittingly beguiled into paying fifty cents for an article consisting of but a fraction of a cent's worth of the most common antiseptic agents, mingled with water.

No. 4297. "*Egyptian Spray*." Egyptian Spray Manufacturing Company, Boston, Mass. Designed for application to floors, furniture, automobiles, etc. A yellow, clear, oily liquid possessing an odor of oil of mirbane, the latter being found to be present on examination. In view of the very poisonous character of oil of mirbane (nitro-benzol) and the fact of cases being on record of serious results following the mere inhalation of this substance under certain circumstances, the use of this product as a floor dressing cannot be recommended from a hygienic standpoint.

No. 4372. *Hazeltine's "Pain-Ease"*. Manufactured by George K. Hazeltine, Concord. This preparation, one-time known as "Liquid Electricity," purports to contain 15.80% of alcohol and is intended as a remedy for rheumatism. The analysis shows 1.41% of extractive and mineral matter, in which was identified sulphate of iron, ammonium chloride, sodium chloride, menthol and a pungent principle, probably capsicum. The sample contained no alkaloids nor chloroform.

No. 4403. "*Honest Scotch Snuff*." Manufactured by American Snuff Company. This brand was submitted for the purpose of ascertaining the possible presence of opiates, etc. No additions of this nature were detected.

No. 537. *Le Baume Rhumal* (Cough Balsam). L. R. Baridon, Montreal. Said to "destroy the microbe or germ of the most dreadful diseases." Sample contains alcohol and morphine, not declared. Misbranded.

No. 3974. *Nurses' and Mothers' Treasure*. P. E. Picault, Montreal. Sample contains 6.60 per cent. alcohol, not declared. Misbranded.

No. 4515. *Gauvin's Aniseed Syrup*. J. A. E. Gauvin, Montreal. The English labeling contains a declaration showing "one-fourth grain morphine acetate and six per cent. spirit of wine" per ounce. The designation "spirit of wine" does not comply with the legal requirements. Misbranded.

No. 4517. *Children's Comfort*. George E. Fairbanks, Worcester, Mass. No declaration as to alcohol or morphine. The following are among the claims made for this preparation: "It is a concentrated Food." "It does away with dangerous narcotics." "Is safe and reliable." "Remember, mothers, . . . that your children will grow healthy and strong by its use." These claims are not only all



untrue but are most vicious, considering the impression they are calculated to create in the mind of the average user of such nostrums. Sample contains morphine. Misbranded.

No. 4464. *Auto-Masseur*. A treatment for obesity. Manufactured by "Prof." S. H. Burns, 1300 Broadway, New York. Consists of an elastic belt carrying a metallic spiral ring about five inches in diameter, the latter intended to be worn over the umbilicus. The ring consists of two parts, one half brass, the other brass, silver plated, the ends being connected by spirals of fine wire soldered together. In addition to this interesting appliance there are two "accelerating auxiliaries"—"Absorbine" and "Shrinkine." The "Shrinkine" was not submitted but the "Absorbine," a bit of which is to be "rubbed over the deepest accumulations of fat for five minutes," seems to consist of nothing more powerful than "unguentum aquae rosae." The manufacturer is confident that "simply wearing my Auto-Masseur, regardless of age or sex, will permanently reduce superfluous flesh from all parts—face, chest, back, hips, legs, or abdomen." Nor is this all, for we read that "rheumatic and nervous affections, indigestion, flatulency, constipation, female weaknesses, weak circulation and fatty degeneration of the heart, lungs, kidneys, and liver yield quickly to its curative action." It is almost unnecessary to suggest that the dieting recommended, in conjunction with the simple massage treatment involved, is altogether responsible for any improvement that may be noted.

No. 4473. *Gillespie Scalp Invigorator*. Gillespie Manufacturing Company, Boston. Claims 25 per cent. alcohol. The analysis shows 23.93 per cent. alcohol with 2.91 per cent. solids, the latter consisting principally of glycerin, with some cantharides and a trace of salt. Passed.

No. 4463. *Eckman's Alterative*. Eckman Manufacturing Company, Market and Sixth Streets, Philadelphia, Pa. Price, \$2.00 per bottle (half pint). "For all throat and lung diseases, including tuberculosis." Guaranteed under the Food and Drugs Act. We read that this preparation was perfected by a veterinary surgeon, who first demonstrated its curative (?) properties upon cattle and later upon a member of his family. The present proprietors of this alleged remedy issue a booklet abounding in claims to the effect that the preparation is a cure for consumption. "We do not claim to cure tuberculosis in the last stage, although we have such cases on record." The analysis shows 6.80 per cent. of total solids on evaporation, consisting mainly of calcium chloride, the quantity of this salt found, calculated to the anhydrous condition, amounting to 3.59 per cent. Some suspended

matter noted consisted of powdered clove. The preparation is held as misbranded.

No. 4481. *Kosine*. "For the relief and cure of epilepsy, etc." Kosine Company, Washington, D. C. This was found to consist essentially of a combination of bromides with antipyrin. The analysis shows antipyrin, 0.64 per cent.; ammonium bromide, 4.97 per cent.; fixed bromides (as sodium bromide), 2.40 per cent. Antipyrin is a powerful depressant, in this respect being in the same class with such dangerous drugs as acetanilid, phenacetin and similar compounds. It seems unfortunate that the law requiring a declaration upon the label of the presence in any preparation of the last-named bodies was not made to include antipyrin. Passed.

No. 4824. *Robinson's Patent Barley*. "For Infants' Food, Barley-Water and Pudding." Keen, Robinson & Co., Ltd., London, Eng. The examination fails to indicate that this preparation differs in any essential, or in fact is anything more, than simple barley flour. If it contains any diastatic ferment the latter must be present in an inappreciable quantity, as the starch seems to undergo no material hydrolysis when heated at the appropriate temperature. In view of this fact, one of the suggestions appearing upon the label to the effect that the barley be "mixed with warm water to the consistency of milk, and then to add to cold milk and given through the bottle" appears open to criticism. Notwithstanding that the use of barley-water as a constituent of the infant dietary is extremely common, this imported product seems to be the only source of barley—aside from the whole grain—that is carried to any extent by local dealers. The popular half-pound size retails for eighteen to twenty cents, which, in view of the low cost of the grain, seems an unwarrantable price for the American consumer to be called upon to pay.

No. 4712. *Dar-Lin-Oil*. Hemlock Oil Company, Derry. This preparation consists of a combination of essential oils and pungent substances, among which seems to be included the highly pungent oil of mustard. Its action is that of a counter-irritant. Contains no constituents requiring declaration.

No. 4711. *Pain-Anodyne*. Lafayette Company, Berlin and Montreal. Represents an alcoholic solution, similar in general character to the preceding. Properly labeled.

No. 4710. *Wilson's Headache Powders*. Wilson Pharmacy, Berlin. The declaration relative to the presence of acetanilid and phenacetin appears upon the back of the packet, instead of upon its face where it should be. Misbranded.

No. 4708. *German Fir*. Dilliard Remedy Company, East Bangor, Pa. Labeled in bold type as a "cough and consumption cure." Label contains no statement of the presence of alcohol and opiates. Misbranded.

No. 4713. *Moxie*. Moxie Nerve Food Company of New England, Boston. Labeled as being a "compound for the nervous system—of great value in restoring lost nervous energy." Contains no saccharin nor constituents requiring declaration; the claims for this preparation, however, are somewhat questionable.

*Mt. Madison Neurene Nerve Food*. Harriman Spring Company, Gorham. Represented that it "builds up nerve tissues, tones up the heart, gives power to the brain." Questionable labeling. Even if drugs existed that could do all these things, such would have no proper place in a preparation designed to be sold as a beverage by the general dealer.

No. 4714. "*Yo-Yo*." The Yo-Yo Company, Sudbury, Mass. Represented as "a most delicious, refreshing and healthful beverage, from the uva ursi herb, nature's own kidney food, with a combination of other native herbs that have proved the best known tonic for indigestion and rheumatism." Contains extractive matter, 6.01 per cent.; mineral matter, trace; alcohol, 1.05 per cent. No salicylic acid.

*Hill's Cascara-Bromide-Quinine*. W. H. Hill Company, Detroit, Mich. Recommended not only for the cure of colds, coughs, catarrh, bronchitis and La Grippe, but for headache, for constipation and for use as a general tonic. This preparation contains acetanilid, and an extensive practise with the manufacturers is the house-to-house distribution of free samples, the latter being contained in an envelope. The only intimation given of the presence of acetanilid is the statement on a fac-simile of the regular package which appears upon the back of the envelope, whereas the law requires that such information shall be given upon the principal label, *i. e.*, in this case the face of the envelope—it being most properly held by the federal authorities that free samples are not exempt from this requirement. Some of the statements contained in the circular accompanying the samples are not only untrue and misleading, but are calculated to be vicious in their consequences. Thus these tablets are represented as containing "no mineral poisons or *injurious drugs*," whereas acetanilid,—used in the absence of skilled oversight, is now well recognized as being a dangerous substance. The circular also devotes considerable space to the advocacy of the use of these tablets as a "tonic laxative," and, in fact, as a general tonic, advancing the argument that they

"can be carried in the pocket and swallowed when needed." The regular and harmful drugging with acetanilid to which these suggestions must lead is only exceeded in reprehensibility by that involved in the promiscuous distribution of the samples. The latter are thrown about everywhere and must be not infrequently picked up and swallowed by children. There would seem, in fact, to be need of a law prohibiting the indiscriminate distribution of drugs in the manner here shown.

*Hay's Hair Health.* Philo Hay Specialty Company, Newark, N. J. In a previous issue of the *Bulletin* (April, 1907) this preparation was found to contain lead acetate and sulphur and was reported as misbranded. A recent examination shows substantially the same composition, but the false statements as to its character and what this preparation will accomplish no longer appear upon the label. However, the proprietors have no scruples over continuing their misrepresentations in their advertising, a recent advertisement representing that "It is not a dye. It contains no chemicals—no dye substances. It doesn't color hair, but restores it. It brings back the exact color and luxuriant beauty of youth—puts it back in the precise condition it was in before it began to turn gray or to fade." Until such time as the law requiring truthfulness in labeling shall be extended to include advertising, there will be no legal means of preventing resort to this method of deluding the public.

No. 4735. *Queen of Beauty Louisenbad Reduction Salt.* Karl Landshut, importer, Chicago. "Obtained by concentration." "A remedy for obesity without the use of drugs, dieting, or exercise." "It is a concentration of bath salts such as are contained in the wonderful bath springs of Europe." "Louisenbad Reduction Salt brings these famous baths to your own tub." Analysis shows the following composition:

Sodium chloride.....	31.77%
Sodium sulphate.....	34.43%
Potassium sulphate.....	32.31%
Calcium sulphate.....	0.73%
Magnesium sulphate .....	0.15%
Silica .....	0.03%
Iron and alumina.....	0.01%
Loss on ignition .....	0.27%
	<hr/>
	99.70%



The above therefore indicates that the preparation is approximately a mixture of equal parts common salt, sulphate of soda and sulphate of potash. It is not conceivable that the proprietors would follow the roundabout method of preparing a simple mixture of this character by concentration of a natural water, as they claim to do. An inquiry in this connection addressed to the importer brought only an evasive reply; but even though the product was as represented, it could have no possible advantage over a common mixture costing one tenth as much.

No. 5050. *Parnotis*. H. S. Peterson & Co., Chicago. This is another recent addition to the list of so-called "obesity reducers." While the proprietor guarantees the product under the Food and Drug Act, he is very non-committal as to what it will do. In fact the only information in this connection to be gleaned from the label is the statement: "Use Parnotis for making Flesh Reducing Remedy," accompanied by the directions, which instruct to dissolve contents of package in one and one-half pints of water and take a tablespoonful three times daily before meals. The preparation, which costs fifty cents per quarter pound package, consists of a pale-yellowish, perfumed powder, soluble in water to a slight turbidity. While no printed claims are made to this effect, circulation seems to have been given to the impression that thyroid is the active principle, a view which the color and general appearance might tend to bear out. Analysis, however, fails to give any evidence of the presence either of this or of any other organic substance, save the perfume and a trace of coloring matter. A mixture of bicarbonate and sulphate of soda is all that the examination reveals.

*Viavi Treatment*. Inquiries have been received as to the character and value of the remedies and treatment involved in the so-called "Viavi System of Hygiene." Although this self-styled "Health Movement" has already been pretty thoroughly exposed,<sup>1</sup> the appearances are that it is still in a fairly "healthy" condition, so far as its continuance as a source of revenue to its promoters is concerned. On page 81 of "The Great American Fraud," we find the Viavi Company classified as "a fake concern which preys upon impressionable women." It "has organized its elaborate 'lecture bureau,' mostly women, to spread its doctrines, the chief of which is that every woman has something wrong with her, and that whatever it is, Viavi preparations alone will cure it." The hand-book entitled "Viavi Hygiene" consists of a clever dissertation on the value of the "Viavi Treatment" as applied to the ills of womankind—a book well calculated to be



convincing to the average woman, although, for the medical practitioner, abounding in amusing statements, than which no better evidence could be wished as to the true character of the system. In short, the treatment, based as it is largely upon the observance of personal cleanliness and the application of simple massage, involves no new ideas, and we are unable to find any warrant for the claim that the medicines possess any special or remarkable value as "food for the nerves and tissues," or that there is anything at all unusual or peculiar about them, aside from the exorbitant price charged therefor.

No. 5128. *Whitcomb's Rheumatic Indian Liniment*. C. Whitcomb, Apthorp. This product, which claims to be a cure for a great variety of ailments, including "paralyzed limbs" and "kidney complaint," was found to consist principally of petroleum benzine, together with some other volatile oils. Misbranded.

#### EXAMINATION OF LIQUORS FOR THE STATE LICENSE COMMISSION.

During the two-year period ending August 31, 1910, one hundred and three samples of liquors have been submitted by agents of the State License Commission, the results of the examinations having been duly reported to the body. This represents a notable falling off as compared with the number hitherto received from this source. Most of the samples consisted of whiskey, a few of which were found to be markedly deficient in alcoholic content. Aside from the alcoholic content the only question liable to arise in connection with a distilled liquor is as to its proper branding and sale. Numerous examinations for wood alcohol and other deleterious constituents, made at this laboratory, have uniformly afforded negative results.

The following letter, recently addressed by me to the State License Commission, is suggestive of the questions arising as to the proper branding of distilled liquors:

*State Board of License Commissioners,  
Concord, N. H.*

GENTLEMEN:—The recent decision of the president as to what may be sold as "whiskey" under the federal act of June 30, 1906, is not only somewhat revolutionary in character, but is opposed to the legal standards in force in a number of states. Nevertheless, notwithstanding its antagonism of certain fundamental principles, in my opinion this ruling will ultimately obtain as the guide by which the proper designation of whiskey will be determined.

The vital point at which this dictum conflicts with the views of food officers is in the declaration that neutral spirits (alcohol) when reduced to potable strength (with water), and colored and flavored, is entitled to be known as whiskey, and that a mixture of such with straight whiskey may properly be designated a blend—assuming the latter word to refer to a mixture of like substances. It should be

noted, however, that the president's ruling is to the effect that the variety of whiskey must be declared upon the package label, *e. g.*, "neutral spirit whiskey" must be labeled as such, and a mixture of the latter with straight whiskey should be designated as a blend of neutral spirits and straight whiskey.

In the past, most of the samples submitted at this laboratory have been drawn from barrels, such samples having been for the most part undesignated. Since no added deleterious matter is now ever present in commercial whiskey, and as the question under the president's ruling becomes almost wholly one of grade or kind, *i. e.*, of labeling, future samples should as far as possible represent original packages. Except as to the proportion of alcohol (always low in neutral spirit whiskey). The analysis of an undesignated barrel sample has no significance of any value.

Respectfully,

(Signed) C. D. HOWARD,

*Chemist.*

January 11, 1910.

## INFLAMMABLE STOVE-POLISH.

---

In a suit brought before the Hillsborough County Court as a result of injuries attending the use of an inflammable stove-polish, the jury has recently awarded the plaintiff damages in the sum of \$7,000. The victim, a young woman, was so severely burned as to be permanently injured and disfigured as a result of applying this polish to a stove the fire in which was low. The case was vigorously contested, having been before the courts nearly three years, and once before the Supreme Court.

The polish in question was known as "6-5-4 Self-Shining Stove Lustra," manufactured by Crosby & Co., Detroit, Mich. An investigation of this polish showed that it not only gave off inflammable vapors at the ordinary temperature but that it continued to do this when cooled to a point twelve degrees below the freezing temperature, and furthermore, that at a temperature but little above the freezing point the application of a lighted match was sufficient to cause the preparation to take fire and burn continuously. A distillation showed the polish to consist in part of highly inflammable constituents, as follows:

Petroleum ether.....	1.5%
Gasoline.....	9.0%
Naphtha.....	30.0%
Petroleum benzine.....	32.0%
Residuum.....	27.5%

Not only is this product highly inflammable but the vapors when ignited in a confined space, as the firebox of a stove, would tend to explode. In this case the inflamed contents of the can were thrown upward against the breast and face of the user. Nevertheless, the label contained no warning that there was anything dangerous about the article and it was alleged that the latter was represented to the plaintiff by the salesman as being perfectly safe.

Even at the present time the "caution" which the label of this product bears is inconspicuously placed and is so worded as to be calculated to lead the user to believe that the statement has to do more with secur-

ing the maximum of efficiency rather than conveying a suggestion of any particular danger. "Let the label tell the truth" is a slogan that should be given wider application. Already, as a result of similar occurrences, the city of New York has recently adopted an ordinance regulating the sale and storage of such articles, this ordinance providing among other things that such polishes must be packed in tin cans with a screw top, containing not more than one quart and bearing in letters a quarter of an inch high the label: "Danger; this can contains dangerous inflammable liquid," as well as a warning against the use of the contents within fifteen feet of any fire.

Incidentally the above case is of interest in connection with the enforcement of the food and drug law of this state in that it seems to definitely establish the responsibility of the store proprietor for the statements of his salesmen.

# THE INSPECTION OF WATER SUPPLIES AT SUMMER HOTELS AND BOARDING HOUSES.

By C. D. HOWARD, *Chemist*.

---

Following is a preliminary report of the inspection of water supplies at the New Hampshire vacation resorts. These samples were collected by the inspector of the Board during July and August, 1910.

In addition to taking samples of water, the inspector has noted conditions about the source of supply, such as the neighborhood of cess-pools, stables, etc., the use of lead or galvanized iron pipe, the degree of cleanliness of the premises, and other conditions liable to have a bearing upon the quality of the water supplied the guests.

As a whole, the results are highly gratifying. In the mountain district the supplies in the majority of cases are drawn from springs, which are generally located upon some mountain side, far remote from any chance of organic contamination. As was anticipated, these waters show a high degree of organic purity. Unfortunately, in a very few cases, representing otherwise water of excellent quality, the proportion of dissolved lead found was sufficient to render the water either wholly unfit or objectionable for drinking. This was also true in a limited number of instances where galvanized pipe is in use. This form of pipe is not proving wholly satisfactory for use with many of our spring waters, in that the latter are prone to take up greater or less quantities of the zinc coating. While dissolved zinc in drinking water is by no means as dangerous as lead, still, in the quantities occasionally observed, its presence is, to say the least, objectionable.

Farther south, in the lake and coast districts, wells seem to be the prevailing source of supply for the hotels, although here too, many springs of excellent quality are to be found. These wells are generally located close to the buildings, and for this reason there is far greater chance for contamination than is the case with the mountain springs. While the majority of the supplies sampled in the lake and country districts has been found to be good, still in one or two sections we have encountered a surprisingly large proportion of polluted wells. In all such cases the proprietors have been advised that this water must not be



served to guests and that other arrangements must be made immediately.

Along the coast it is apt to prove a somewhat difficult matter to secure a supply free from excessive quantities of salt water and which shall be satisfactorily free from organic matter or from the products of oxidation of the latter. Most of the wells are rather shallow and frequently consist merely of a pipe, with strainer, sunken a few feet in the sand. While no cases of gross pollution have been found at the beaches this season, a number of the supplies have been objected to as not being sufficiently pure for table purposes.

Lack of proper maintenance has not infrequently been responsible for our criticism of supplies which were very evidently of inherent purity. In addition to taking the usual precautions for the exclusion of sewage contamination, it is very desirable that open wells and springs be carefully examined at the beginning of each season and unless simple inspection indicates an absolutely clean condition, the source should be pumped or dipped out and the bottom and side walls scraped and rinsed. Such a state of affairs as the growth upon the masonry of ferns, or even of moss (noted in two or three cases), should not be tolerated. It is also very desirable that the well or basin be cemented up for several inches above the surface of the ground, and if the adjacent soil is at all loose, the cement should also be continued down into the well for a sufficient distance to insure the exclusion, not only of surface water, but of such chance visitors as toads, snakes, etc.

Two points that may be emphasized are that pure ground water requires no ventilation, and that exposure to sunlight—instead of being beneficial—is apt to be positively detrimental. We have evidence of this fact in the odors and growths that speedily develop whenever a ground water is stored in an open reservoir. Therefore, the supply should be provided with a sound tight cover.

The detailed report following includes only the names of those from whose supplies samples have been taken and the analysis of which, in connection with the local inspection, has warranted a classification of reasonably good and safe quality. Where the analysis has indicated not exceeding 0.5 parts of zinc, the supply has been accepted for the present. Aside from the possibility of question here involved, it is believed that every one of the supplies herein mentioned is usable with safety—the greater number, indeed, representing waters of an unusual degree of excellence. Premises on which the source of supply has been found to be polluted, or to which serious objection has been made, will be subjected to a second inspection later.

Because of prevailing natural conditions at the beaches, a few sources at the latter places have been accepted that would hardly have passed muster if located inland. It should not be inferred, however, that these necessarily represent bad or unsafe water. The names of many of the leading hotels in some of the localities do not appear in this list, for the reason that such have the town or precinct supply—water of excellent quality in every case. Further, there are a number of places in almost every town visited that it has proved impracticable to cover during this season, although it is expected to reach these eventually.

## ANALYSIS OF WATER SUPPLIES AT

(Results are given in

Number.	Town.	Name of House.	Owner.	Source.
8148	Hampton	Maplehurst	C. F. Wood	Well
8151	Hampton	Garland House	A. D. Garland	Well
8152	Hampton	The Willows	I. E. Leavitt	Spring
8161	Little Boar's H'd	Batchelder's	A. Batchelder	Well
8162	Little Boar's H'd	Batchelder's	A. Batchelder	Driven well
8163	Rye	R. J. Locke's	R. J. Locke	Well
8164	Rye	Rising Sun Cottage	Mrs. E. B. Philbrick	Well
8167	Rye	Drake House	A. J. Drake	Well
8165	Rye	The Farragut	W. E. Carter	Well
8172	Rye	Sawyer's	Horace Sawyer	Cistern
8039	Franconia	Spooner Farm	Henry Spooner	Spring
8023	Franconia	Forest Hills Hotel	Frank H. Danforth	Spring
8024	Franconia	Whitney Farm	F. Whitney	Spring
8065	North Conway	Echo Farm	A. E. H. Brooks	Spring
8076	North Conway	Ledgeview Farm	Israel C. Davis	Well
8062	Intervale	Maple Villa	George S. Gale	Spring
8059	Intervale	Intervale Farm	Mrs. Frank Carleton	Spring
8058	Intervale	Pitman Hall	Walter Pitman	Spring
8056	Intervale	Pequawket Inn	C. C. Small	Spring
8092	Ossipee	Edgerly Farm	John A. Edgerly	Well
8074	Jackson	Eagle Mountain House	C. E. Gale & Son	Stream
8077	Jackson	Eagle Mountain House	C. E. Gale & Son	Spring
8078	Jackson	Perkins Cottages	C. B. Perkins	Spring
8080	Jackson	Jackson Falls House	Trickey Bros.	Spring
0296	Jackson	Cliff Cottage	C. F. Perkins	Spring
8811	Ashland	Harvard Camp	Harvard Camp Association	Spring
8186	Holderness	Deephaven Camp	Alice M. Bacon	Spring
8185	Holderness	Algonquin Camp	E. Demeritte	Well
8183	Holderness	Old Willoughby House	H. J. Bennett	Spring
8187	Holderness	The Homestead	Mrs. F. B. Boynton	Spring
8188	Holderness	Mt. Morgan Mineral Spring	E. C. Bennett	Spring
8189	Holderness	Asquam House	H. F. Dorr	Spring
8263	Wilton	Abbott Hill-top Farm	G. P. Chandler	Well
8270	Amherst	Grand View House	J. F. McGuiness	Well
8278	Amherst	Baboosic House	W. H. Colston	Well
8300	Sunapee	The Burkehaven	F. H. Davis	?
8303	Sunapee	Granliden	W. W. Brown	Well

<sup>1</sup> For the summarized results of this inspection, see page 228.

SUMMER HOTELS AND BOARDING HOUSES.<sup>1</sup>

parts per 100,000.)

Number.	Pipe.	Appearance.				Ammonia.		Nitrogen as		Chlorine.	Hardness.	Lead.	Zinc.
		Turbidity.	Sediment.	Odor.	Color.	Free.	Albuminoid.	Nitrates.	Nitrites.				
8148	Galvanized.	None....	None.....	None....	0.05	.0016	.0014	.005	.0000	.80	3.9	....	tr. ..
8151	Galvanized.	None....	V. slight..	None....	0.05	.0010	.0006	.003	.0000	.75	3.9	....	.4 ..
8152	Source.....	None....	V. slight..	None....	0.05	.0018	.0024	.005	.0000	1.90	3.2	....	..
8161	Galvanized.	None....	None.....	None....	0.05	.0068	.0004	.003	.0000	4.70	6.0	....	.0 ..
8162	Galvanized.	None....	None.....	None....	0.00	.0004	.0010	.200	.0000	4.30	6.0	....	.0 ..
8163	Galvanized.	None....	None.....	None....	0.05	.0004	.0026	.150	.0000	27.†	7.4	....	.0 *
8164	(Source)....	None....	V. slight..	None....	0.05	.0010	.0036	.015	.0000	2.90	4.6	....	..
8167	Galvanized.	None....	Slight....	None....	0.00	.0002	.0014	.175	Tr.	12.30	6.7	....	.4 *
8165	Galvanized.	V. slight	None.....	S. earthy	0.05	.0016	.0038	.005	Tr.	3.90	9.6	....	..
8172	Galvanized.	None....	None.....	None....	0.10	.0020	.0035	.003	.0000	1.10	3.9	....	tr. ..
8039	Lead.....	None....	V. slight..	None....	0.05	.0030	.0006	.003	.0000	.10	1.9	.015	..
8023	(Source)....	None....	S. flocc..	None....	0.00	.0010	.0015	.005	.0000	.15	1.2	....	..
8024	?	None....	V. slight..	None....	0.05	.0020	.0010	.050	.0000	.05	1.9	.0	0 ..
8065	Galvanized.	V. s. opal	Slight....	None....	0.10	.0005	.0010	.005	.0000	.05	1.9	.0	6† ..
8076	Galvanized.	None....	Slight....	None....	0.00	.0030	.0025	.003	.0000	.04	0.6	....	.0 ..
8062	Galvanized.	V. slight	V. slight..	None....	0.15	.0010	.0015	.005	.0000	.05	0.9	....	.0 ..
8059	Lead, gal....	None....	V. slight..	None....	0.00	.0006	.0010	.005	.0000	.04	2.6	.037	.0 ..
8058	Galvanized.	None....	V. slight..	Earthy..	0.05	.0005	.0020	.005	.0000	.04	0.6	....	tr. ..
8056	Plain iron..	None....	S. ferrug..	None....	0.10	.0005	.0010	.003	.0000	.05	2.6	....	..
8092	Galvanized.	None....	None.....	None....	0.05	.0005	.0010	.010	.0000	.45	4.0	....	.0 ..
8074	Galvanized.	None....	V. slight..	S. earthy	0.05	.0010	.0025	.010	.0000	.04	0.4	....	tr. ..
8077	Galvanized.	None....	None.....	None....	0.00	.0005	.0015	.045	.0000	.05	2.6	....	.0 ..
8078	(Source)....	V. slight	V. slight..	None....	0.05	.0015	.0020	.040	.0000	.10	3.9	....	† ..
8080	Galvanized.	None....	Sl. flocc..	None....	0.00	.0020	.0020	.005	.0000	.05	1.9	....	.0 ..
8096	Galvanized.	None....	Sl. flocc..	None....	0.10	.0010	.0015	.003	.0000	.05	1.2	....	.0 ..
8211	(Source)....	None....	None.....	None....	0.05	.0005	.0005	.005	.0000	.05	2.6	....	..
8186	Galvanized.	None....	Slight....	None....	0.00	.0005	.0011	.003	.0000	.20	4.6	....	.5† ..
8185	Galvanized.	V. slight	V. slight..	Slight....	0.05	.0010	.0015	.003	.0000	.50	1.9	....	.0 ..
8183	Lead.....	None....	None.....	None....	0.00	.0005	.0011	.003	.0000	.05	2.6	.012	..
8187	Galvanized.	V. slight	V. slight..	None....	0.15	.0010	.0021	.003	.0000	.10	3.9	....	.0 ..
8188	Lead....(tle	None....	None.....	None....	0.00	.0012	.0006	.003	.0000	.05	2.6	.025	..§
8189	(Water-bot-	None....	V. slight..	None....	0.00	.0010	.0010	.010	.0000	.40	3.9	....	..
8263	Galvanized.	S. opal	None.....	S. earthy	0.05	.0015	.0015	.075	.0000	.30	1.2	....	.0 ..
8270	(Source)....	None....	V. slight..	None....	0.05	.0015	.0020	.050	.0000	.30	1.2	....	..
8273	(Source)....	V. slight	None.....	None....	0.00	.0010	.0010	.020	.0000	.20	4.6	....	..
8300	Lead, gal....	None....	None.....	None....	0.05	.0005	.0005	.050	.0000	.10	2.6	.00	.3 ..
8303	Galvanized.	None....	None.....	Slight....	0.00	.0010	.0050	.003	.0000	.10	0.4	....	.0

\* Receives some salt water.

† Considerable zinc.

‡ Spring by roadside; good water but surface covered with road dust and sample showed coli. Ordered to be properly covered.

§ Not a mineral spring.

|| Cleaning well advised.

## ANALYSIS OF WATER SUPPLIES AT

(Results are given in

Number.	Town.	Name of House.	Owner.	Source.
8063	Bethlehem.....	Turner's Tavern.....	A. C. Otto.....	Spring.....
8070	Bethlehem.....	George H. Turner.....	George H. Turner.....	Spring.....
8069	Bethlehem.....	R. H. Gardner.....	R. H. Gardner.....	Spring.....
8061	Bethlehem.....	Farm Cottage.....	Mrs. Laura M. Phillips.....	Spring.....
8075	Bethlehem.....	Fitzgerald Cottage.....	Mrs. M. B. Fitzgerald.....	Spring.....
8071	Bethlehem.....	The Maplewood.....	L. H. Cilley.....	Spring.....
8082	Bethlehem.....	James Endey.....	James Endey.....	Spring.....
8026	Lisbon.....	Hotel Lookoff.....	A. E. Safford.....	Spring.....
8022	Lisbon.....	Hill-Rest.....	H. M. Smith.....	Spring.....
8021	Lisbon.....	Miramonte.....	A. B. Atwood.....	Spring.....
8025	Lisbon.....	The Jessemine.....	Mrs. L. J. Jessemine.....	Spring.....
8027	Lisbon.....	The Echoes.....	A. E. Jessemine.....	Spring.....
8028	Lisbon.....	Sunset Hill House.....	S. F. Hoskins.....	Spring.....
8029	Lisbon.....	The Homestead.....	Simeon Bowles.....	Spring.....
8080	Lisbon.....	The Highland Farm.....	W. D. Smith.....	Spring.....
8248	Lisbon.....	Peckett's.....	R. P. Peckett.....	Spring.....
8050	Fabyan's.....	Fabyan House.....	Barron, Merrill & Barron.....	Spring.....
8049	Bretton Woods..	Mount Pleasant Cottage.....	Bretton Woods Co.....	Spring.....
8051	Bretton Woods..	Mount Pleasant Hotel.....	Bretton Woods Co.....	Spring.....
8052	Crawford's.....	Crawford House.....	Barron, Merrill & Barron.....	Spring.....
8054	Crawford's.....	Crawford House.....	Barron, Merrill & Barron.....	Spring.....
8053	Bretton Woods..	Mount Washington Hotel.....	Bretton Woods Co.....	Spring.....
8033	Lincoln.....	Flume House.....	L. W. Blankenship.....	Spring.....
8123	Lakeport.....	Lakeshore Farm.....	Mrs. I. P. Wilkinson.....	Well.....
8118	Laconia.....	Grand View House.....	O. C. Johnson.....	Well.....
8116	Laconia.....	The Lakeside.....	H. H. Bennett.....	Spring.....
8117	Laconia.....	Lakeview Inn.....	J. O. Bennett.....	Spring.....
8122	Laconia.....	Wadleigh Farm.....	E. C. Hayward.....	Well.....
8124	Meredith.....	Mountain View House.....	W. H. Keyser.....	Well.....
8126	Meredith.....	Clover Ridge Farm.....	M. C. Brown.....	Spring.....
8285	Meredith.....	Bear Island House.....	O. H. Lewis.....	Well.....
8095	Wolfeboro.....	Lake and Mountain House.....	Henry Morgan.....	Well.....
8094	Wolfeboro.....	Hersey Farm.....	J. H. Hersey.....	Well.....
8093	Wolfeboro.....	Haynes Farm.....	Alice M. Haynes.....	Spring.....
7921	Tamworth.....	Chocorua House.....	Chocorua House Syndicate.....	Well.....
8091	Tuftonborough..	Bonnyview Farm.....	F. A. Doe.....	Well.....
8236	Moultonborough	The Homestead.....	G. A. Blanchard.....	Well.....
8224	Sandwich.....	Sandwich House.....	E. Merryfield.....	Well.....
8227	Sandwich.....	Wayside Farm.....	C. A. Foursins.....	Spring.....
8228	Sandwich.....	Hotel Commonwealth.....	C. S. Burnham.....	Well.....
8232	Sandwich.....	Moulton Farm.....	H. E. Moulton.....	Spring.....
8190	Holderness.....	Mt. Livermore House.....	F. J. Pease.....	Spring.....
8191	Holderness.....	Hillside Cottage.....	A. Fellis.....	Well.....
8193	Holderness.....	Central House.....	J. S. Davison.....	Spring.....
8192	Holderness.....	Winona Fields.....	Fessenden & Lakeman.....	Well.....
8130	Center Harbor..	Oakhurst.....	Mrs. G. W. Lorey.....	Well.....
7955	Center Harbor..	Moulton Hotel.....	S. L. Emery.....	Spring.....
8213	Center Harbor..	The Colonial.....	W. A. Maclean.....	Spring.....
8206	Center Harbor..	Cluster Cove.....	C. E. Goodrich.....	Spring.....
8205	Center Harbor..	Orchard Farm.....	A. J. Smith.....	Well.....
8204	Center Harbor..	Maple Cottage.....	E. G. Moulton.....	Well.....
8145	Hampton Falls..	The Wellswood.....	S. A. Gove.....	Spring.....
8147	Hampton Falls..	Hampton Falls House.....	D. F. Batchelder.....	Spring.....
8144	Hampton.....	Elmwood Farm.....	Mrs. S. S. Walton.....	Well.....

<sup>1</sup> For the summarized results of this inspection, see page 228.



SUMMER HOTELS AND BOARDING HOUSES.<sup>1</sup>

parts per 100,000.)

Number.	Pipe.	Appearance.				Ammonia.		Nitrogen as		Chlorine.	Hardness.	Lead.	Zinc.
		Turbidity.	Sediment.	Odor.	Color.	Free.	Albuminoid.	Nitrates.	Nitrites.				
8063	Lead & galv.	None...	None....	None....	0.10	.0030	.0020	.007	.0000	.06	1.2	.012	.0
8070	Galvanized.	None....	None....	None....	0.05	.0010	.0010	.010	.0000	.05	1.2	...	.0
8069	Lead & galv.	None....	Slight...	None....	0.05	.0010	.0020	.005	.0000	.04	1.9	.025	.0
8061	Galvanized.	V. slight	V. slight...	None....	0.10	.0010	.0020	.003	.0000	.10	6.3	...	.0
8075	(Source)...	None....	V. slight...	None....	0.00	.0030	.0020	.050	.0000	.10	2.6	...	...
8071	Galvanized.	None....	None....	None....	0.10	.0050	.0040	.003	.0000	.07	2.6	...	tr.
8082	Lead .....	None....	Slight...	None....	0.00	.0020	.0025	.005	.0000	.04	2.6	.037	...
8026	(Source)...	None....	None....	None....	0.05	...	...	.010	.0000	.20	1.9	...	...
8022	Lead .....	None....	None....	None....	0.00	.0025	.0015	.005	.0000	.10	4.6	.012	...
8021	Galvanized.	None....	None....	None....	0.00	.0020	.0010	.050	.0000	.18	2.9	...	.4
8025	Lead, gal.	Slight...	Con. floc.	S. earthy	0.05	.0020	.0010	.020	.0000	.10	4.6	.012	.0
8027	Galvanized.	None....	V. slight...	None....	0.05	.0010	.0005	.010	.0000	.25	2.7	...	.0
8028	Cem. lin. iron	S. opal	V. slight...	None....	0.05	.0010	.0010	.005	.0000	.10	2.2	...	...
8029	Lead .....	None....	None....	None....	0.05	.0010	.0015	.005	.0000	.05	2.6	.025	...
8030	Lead, gal.	V. slight	V. slight...	S. earthy	0.00	.0010	.0005	.005	.0000	.05	1.4	.037	.0
8248	Galvanized.	None....	None....	None....	0.05	.0018	.0004	.020	.0000	.57	4.6	...	.8†
8050	Plain iron.	None....	None....	None....	0.20	.0010	.0025	.007	.0000	.04	1.9	...	...
8049	Galvanized.	None....	None....	None....	0.05	.0010	.0025	.005	.0000	.04	1.3	...	.0
8051	Galvanized.	None....	None....	None....	0.00	.0005	.0008	.003	.0000	.04	1.9	...	.0
8052	Galvanized.	None....	None....	None....	0.05	.0004	.0008	.005	.0000	.04	1.9	...	.4
8054	(At source).	None....	None....	None....	0.00	.0006	.0008	.005	.0000	.04	1.9	...	...
8053	Plain iron.	None....	V. slight...	None....	0.05	.0006	.0020	.003	.0000	.04	1.2	...	...
8033	Wooden	None....	None....	None....	0.15	.0006	.0050	.015	.0000	.08	1.2	...	...
8123	Galvanized.	S. opal	S. floc.	None....	0.05	.0004	.0032	.005	.0000	.08	2.6	...	.0
8118	Lead .....	None....	None....	None....	0.00	.0005	.0003	.020	.0000	1.80	2.6	.012	...
8116	Galvanized.	None....	V. slight...	None....	0.00	.0015	.0010	.005	.0000	.05	1.2	...	.0
8117	Galvanized.	S. opal	V. slight...	Slight...	0.05	.0008	.0006	.003	.0000	.10	1.2	...	.0
8122	(Source)...	V. S. opal	None....	None....	0.05	.0010	.0046	.020	.0000	.35	3.3	...	\$
8124	Lead .....	None....	None....	None....	0.05	.0008	.0016	.020	.0000	.45	2.6	.012	...
8126	Galvanized.	None....	V. slight...	None....	0.00	.0006	.0024	.010	.0000	.12	3.2	...	.6†
8285	(Source)...	None....	None....	None....	0.05	.0008	.0050	.005	.0000	.15	1.9	...	\$
8095	(Source)...	None....	Slight...	None....	0.05	.0030	.0035	.050	.0000	.30	1.9	...	...
8094	(Source)...	None....	None....	None....	0.00	.0011	.0020	.005	.0000	.25	2.6	...	...
8093	Lead .....	None....	V. slight...	None....	0.00	.0005	.0010	.020	.0000	.25	1.9	.012	...
7921	Galvanized.	None....	None....	S. earthy	0.00	.0015	.0020	.005	.0000	.25	0.4	...	...
8091	(Source)...	None....	Slight...	None....	0.00	.0025	.0020	.005	.0000	.15	0.4	...	...
8236	?	None....	None....	None....	0.05	.0004	.0004	.010	Tr.	.21	1.9	.000	.0
8224	(Source)...	None....	V. slight...	Slight...	0.00	.0014	.0046	.040	.0000	.61	5.3	...	...
8227	Lead .....	None....	None....	V. slight...	0.00	.0012	.0016	.030	.0000	.57	3.2	.020	...
8228	Iron .....	None....	V. slight...	S. earthy	0.05	.0008	.0012	.005	.0000	.15	1.9	...	...
8232	Lead .....	None....	V. slight...	None....	0.00	.0004	.0014	.005	.0000	.12	3.9	.040	...
8190	Galvanized.	None....	V. slight...	None....	0.05	.0008	.0010	.010	.0000	.10	1.9	...	.0
8191	(Source)...	None....	None....	None....	0.05	.0010	.0015	.003	.0000	.10	1.2	.000	.0
8193	Lead .....	None....	V. slight...	None....	0.00	.0005	.0005	.003	.0000	.05	2.6	.037	...
8192	Lead .....	None....	None....	None....	0.05	.0010	.0008	.003	.0000	.10	1.9	.012	...
8130	Lead .....	None....	None....	None....	0.05	.0002	.0004	.005	.0000	.08	1.9	.000	...
7955	Galvanized.	None....	S. earthy.	S. earthy	0.05	.0010	.0010	.015	.0000	.12	3.6	...	...
8213	Galvanized.	None....	None....	Slight...	0.05	.0010	.0045	.005	.0000	.10	1.7	...	.0
8206	Tin-lin. lead	None....	None....	None....	0.00	.0015	.0010	.200	Tr.	.85	3.9	.010	...
8205	(Source)...	None....	None....	None....	0.00	.0005	.0018	.003	.0000	.35	2.6	...	...
8204	Wood .....	None....	V. slight...	Slight...	0.05	.0010	.0025	.0000	.00	.90	3.2	...	...
8145	Galvanized.	None....	Slight...	None....	0.05	.0026	.0018	.045	.0000	.75	3.2	...	.0
8147	Lead .....	V. slight	None....	S. earthy	0.00	.0016	.0004	.005	.0000	.75	4.6	.000	...
8144	(Source)...	None....	Slight...	None....	0.05	.0014	.0048	.020	.0000	.55	1.9	...	...

\* Slight excess of organic matter present. Cleaning spring advised. Latter is remote from any chance of pollution.

† Sample taken shortly after a shower; said to be normally clear.

‡ Considerable zinc.

\$ Cleaning well advised.

|| Well stones heavily moss-grown.

## SUMMARY OF WATER SUPPLY INSPECTION OF SUMMER RESORTS.

Town.	Acceptable.	Non-acceptable.	Excessive lead.	Total supplies examined.
Amherst.....	2	1	1	3
Ashland.....	1	1	0	2
Bethlehem.....	7	2	1	9
Center Harbor.....	6	9	0	15
Conway .....	6	1	1	7
Crawford Notch District.....	6	0	0	6
Franconia.....	3	1	1	4
Hampton.....	4	6	0	10
Hampton Falls.....	2	0	0	2
Holderness .....	10	0	0	10
Jackson.....	5	0	0	5
Laconia.....	5	1	1	6
Lincoln.....	1	0	0	1
Lisbon.....	8	1	1	9
Meredith* .....	3	4	3	7
Moultonborough .....	1	3	0	4
North Hampton.....	2	1	0	3
Ossipee.....	1	3	0	4
Rye .....	5	5	0	10
Sandwich.....	4	2	0	6
Sunapee.....	2	1	0	3
Tamworth .....	1	0	0	1
Tuftenborough .....	1	3	0	4
Wilton.....	1	0	0	1
Wolfeboro.....	3	0	0	3
Totals .....	90	45	9	135
Per cent.....	67	33	6.7	

\* Including Bear Island.

## INVESTIGATION OF THE WATER SUPPLY OF THE TOWN OF ANTRIM.

---

During September, 1908, the water supply of Antrim developed a bad taste and odor. Following is a report of the result of an investigation caused to be made by the Board:

*To the Board of Water Commissioners, South Antrim Village Precinct, N. H.:*

Gentlemen: An inspection of your water system made by me September 29, 1908 at the request of the Board of Health, shows the following facts:

I find the supply consists of a pond of sixteen acres located about four miles from the village, the water being conducted thereto by a wooden main. This pond, an elongated oval in shape, lays in a wrinkle, or "fault" occurring on a hillside, so that the depth increases very gradually from the upper shore; the lower shelves off rather abruptly to a maximum depth of twelve or fifteen feet at high water. The strainer at the intake was found to be located in eight feet of water.

The shores and bottom, though underlaid by sand, are covered by a shallow deposit of black mud which in places approaches muck in character; this represents partly wash of alluvial soil from the hillside, partly decomposed vegetation. The shores are fringed by a tangle growth of under-brush, necessarily inundated at times and now including quite a little material that is rotting along the edge of and in the water. Back from the shores a few rods the pond is practically surrounded by open pasturage. The pond has no inlet nor outlet whatever, and as no evidence has ever been discovered of distinct springs, it seems probable that this sheet of water consists merely of a sink supplied by seepage from the hillside.

While there is no habitation on the water-shed and no chance for the entrance of human sewage, nevertheless, a rather serious circumstance exists in that herds of cattle have access to the shores of the pond at every point. Not only must the latter receive a certain amount of contaminated pasture-wash with every shower, but a place was discovered at the northern shore where the odor alone and independent of the tracked up condition of the ground, furnished ample evidence that the cattle make this a daily drinking and wallowing place.

The immediate cause leading to an investigation was the observing a day or two previously of considerable numbers of dead tadpoles along the shores of the pond. Simultaneously the water developed a very offensive odor and appearance and the Board of Health very properly ordered that its use for domestic purposes be discontinued. At the pond a slight fishy odor was plainly distinguishable in places and the dead tadpoles were found to be rather numerous. A few were observed alive, though in a very feeble condition. These tadpoles were rather remarkable for size, the length in some cases being as much as three inches. According to authorities, the period of metamorphosis is from three to four months, the tadpoles ordinarily assuming the frog character by the first of October, although it is nothing unusual under certain conditions for them to go into the mud at about this date and hibernate in the undeveloped condition.

That the destructive cause was one not confined in its effect to tadpoles was evident from the finding of four or five dead perch floating on the surface. Among the causes that might be ascribed are, the introduction of some parasite into the water, a stagnant condition involving insufficient air to support life, or a noxious state of the water due to the influx of foreign matters. That the latter was responsible became plainly evident from the laboratory examination of samples of water taken from the pond and from the tap. These samples indicated a much worse condition of the water than was evident from the inspection, the analysis indicating not only the presence of much animal detritus, with epithelial cells, etc., but a state of gross pollution, explainable under the circumstances only by the entrance of leachings from cattle manure. The dead tadpoles are therefore to be considered as one of the effects, —not the primary cause of the foul condition of the pond. Just why a similar condition has never developed hitherto is somewhat difficult to understand. Previous analyses have been uniformly favorable, although that of March, last, was noticeably abnormal in some respects, as mentioned at the time.

At present the water can be considered as only suitable for sprinkling and for fire purposes. The condition of the pond will doubtless improve rapidly as decomposition continues, and in time the water will become usable. The time necessary will depend somewhat upon future weather conditions and the early exclusion of the cattle from the shores. This pond is altogether too small in area for the existence of spots such as that previously referred to to be tolerated, and the shores will have to be fenced for a distance of several rods from the water, at the least. In addition, a day or so spent by a couple of men with a team of horses in removing the decaying snags and rubbish, and giving the shores a general cleaning up, would be most advantageous.

Reference was made to the fact that the practice of bathing in this pond is not altogether unknown. This cannot be too severely condemned. The penalty for violating the properly attested and published regulations of your Board of Health is \$10 for each offense, and one or two prosecutions in this connection would doubtless be all that was necessary.

Respectfully submitted,

CHARLES D. HOWARD,

September 30, 1908.

*Chemist.*

Measures were promptly taken toward clearing up and fencing the pond. It proved that the condition of the latter cleared up quite rapidly—more so than was anticipated. Analyses were made at frequent intervals and within thirty days from the date of the complaint the original condition of purity was found to have become re-established.



## REPORT UPON THE NEW FILTER OF THE FRANKLIN WATER WORKS.

---

During April, 1910, samples of water forwarded to this laboratory from the Franklin supply were found to react for the presence of colon bacilli and an order was accordingly issued directing boiling of the water until an investigation as to the probably cause and significance of this appearance could be made. This order apparently having given rise to some local apprehension as to the efficiency of a filter recently established for filtering the water of the Pemigewasset River, a careful inspection was made of the working of the system. The following is from the report of the chemist to the board of water commissioners:

"I was particularly interested in examining the contrivance placed in operation sometime ago by your Board for the purpose of filtering the water of the Pemigewasset River. This filter is installed in an excavation made at some distance from the river bank and consists in part of a top layer of four or five feet of fine sand underlaid by a stratum of gravel. Under the latter, and covering the impervious clay bottom is a net-work of open-jointed drain-tile, which conduct into a large filter-well forty feet in diameter by about thirty feet in depth, located at one end of the filter-bed. On higher ground above the latter is a second excavation into which river water is pumped and from whence, after subsidence and removal of most of the suspended matters, it passes through a gate to the surface of the filter.

"The specific criticism uttered by certain of the local users, to the effect that the filter-bed will eventually become so foul and germ-laden as to be ineffective, is unfounded. Except that the upper sand layers were not so carefully graded as to size of particles, the filter differs in no essential affecting its capabilities from any of the well-known and much more expensive affairs, examples of which are to be found throughout the country. In fact, in a general way, this filter-bed is very similar in its make-up to those in use, and so favorably known, at Albany, New York. It differs of course in that it lacks the expensive concrete wall and bottom construction. While in its present aspect perhaps not what might be called a "pretty" job of construction, still this feature will be vastly improved and a very creditable appearance secured when the margins are evened up and the embankments and surrounding soil grassed over.

"The only cleaning that any of these filters anywhere receive, year in and year out, consists merely in the occasional paring off of the upper inch of dirty sand. Inconceivable as it always is to the layman, it is in this slimy film that two-thirds of the purification occurs. In fact, a filter cannot do good work until this film is established, and it is not advisable to remove it until it becomes so thick as to seriously retard filtration. I may state that, to start with, the river water is of much better char-



acter than the raw water of the majority of cities using filters,—Somersworth, for a near-by instance. This filter should render the water perfectly safe and good.

"The apparent apprehension caused by the recent "boiling" notice is of course regrettable. Nevertheless, on the findings, and considered wholly in the light of a precautionary measure, which it was, there is no warrant for the somewhat severe criticism which the issuance of this notice seems to have provoked. As has already been pointed out, intestinal bacteria are very widely sown by the agency of both man and animals. Their occasional accidental introduction into a supply from the latter source is not only always possible but is in nowise serious; and it was probably what occurred in this case, as it appears from the testimony and an examination of the pumping records that river water was not being used at all during the time in question. Water being an unfavorable medium, unless the pollution is continuous, colon bacilli very rapidly die out following their introduction; but it is because their *persistent* presence might be due to the entrance of human sewage, with the always possible accompaniment of typhoid, that the unexplained finding of these bacteria in a public water-supply should always be a matter for prompt investigation, if the officials are to do their duty by the public."

FRANKLIN, N. H., September 16, 1910.

*Mr. C. D. Howard, State Laboratory, Concord, N. H.:*

My dear Sir: It seemed desirable by comparative examinations to get a line on the work of our filter. We had asked so much of you that I had not the courage to impose this work on you, and so sent some samples to Mrs. Richards. The report recently received confirms so clearly the many examinations of the river and other water which you have made and justifies so thoroughly the favorable anticipations you had the kindness to express of the work of our rather crudely constructed filter that I thought you might like to see it. I therefore enclose the same. Please return in enclosed envelope.

Sample 2 shows the partial purification effected by precipitation and storage before the water is let on to the filter. Sample 3 contains only the effluent of the filter. Sample 4 is from the large well and contains in addition whatever the ground water and natural filtration from the settling basin may add to the effluent of the filter. Sample 5 is the water as furnished the public. These samples were taken when the river was in flood and probably more contaminated than usual.

Any suggestions or comment that you may think will aid us will be gratefully received.

Thanking you for past courtesies, I am,

Very truly,

(Signed) F. N. PARSONS,

The report referred to shows that this filter is capable of doing excellent work—and especially is this true if we consider that the samples were not taken in connection with any pre-arranged "test" but, on the contrary, were collected under conditions more unfavorable than the ordinary.

It is particularly interesting to note the value of the preliminary sedimentation as an agency in the elimination of bacteria. Thus the

report indicates that as a result of this sedimentation alone, a reduction was effected of 75% of the total number of bacteria present in the raw water. A similar purification occurred with regard to the removal of sewage bacteria, which were present in the river water at this particular time. The sample from the filter-well showed a reduction of over 98% of the total bacteria, with no colon bacilli, while the sample from a down town store contained bacteria equivalent to a total removal of *over* 99%.

## INSPECTION OF NEWMARKET AND EXETER WATER SUPPLIES.

---

*Dr. Irving A. Watson, Secretary, State Board of Health:*

Dear Sir: I beg to submit to you herewith a report of the results of inspections made by me October 29, 1909, of the water supplies of the town of Newmarket and Exeter.

### *Newmarket Supply.*

This inspection was made at the request of the board of water commissioners of the town of Newmarket. I find that the supply has its source in springs which form a small brook of about one and one half miles in length to the point of the latter's discharge into the Piscasset River. This brook flows through a very gently sloping, unpopulated and somewhat marshy water-shed, consisting partly of woodland but mainly of pasturage. The soil consists of clay loam underlaid by a heavy clay, in consequence of which the brook, as it progresses toward the river, assumes a considerable turbidity. With a view to eliminating this condition from the water as supplied, a number of years ago a course of ten-inch open jointed pipe of about 1,500 feet length was laid in the bed of the brook and covered by a layer of gravel.

That this serves in some degree for the removal of suspended matters is evident from a comparison of the brook-water with that in the intake well. It would seem also that there must be a certain amount of bacterial filtration, this because of the fact that, whereas the tap water practically never shows the presence of colon bacilli, examinations have indicated that the latter are almost always to be found in the brook-water—as could hardly be otherwise, in view of the total lack of any attempt at the exclusion of cattle from the water shed.

However, the filtration referred to is far from being altogether effective for the removal of turbidity under all conditions, and as might be expected, there is also more or less trouble from clogging, with a consequent reduction in the volume of water available. I was informed that the average daily pumpage is about 160,000 gallons and that during thirty-seven days of the current year it had been found necessary to supplement the spring water by drawing from the Piscasset River. The latter not a large stream and while it is doubtless true as stated that little or no sewage enters it above the village, still I had occasion to draw attention to the existence of a pig-pen located immediately on the bank and but a few rods from the point of intake.

Aside from the use of the river water, the only objectionable sanitary feature in connection with this water-supply is the existence of the pasturage referred to, and its elimination, it appears, would involve the purchase of an entire farm. For a more effective removal of the suspended clayey matters, the installation of a system of "rapid" or mechanical sand filtration would be required, such type of filter being much better adapted to the needs in this case than the ordinary form of sand bed.

### *Exeter Water Supply.*

At the same date, a brief inspection was also made of the supply and filter-plant of the Exeter Water Works.

In this case, the source is a long and very narrow pond of about three fourths mile in length, lying one mile northeast of the town and formed partly by springs, partly by a small brook which enters at the eastern extremity. The immediate water-shed is unpopulated and is mostly wooded, although there is a small acreage in pasture.

The pumping station, with dam and filter-plant are located at the western extremity. The latter was installed some years ago for the purpose of removing the clayey turbidity always present in this water and at times very marked. There is the usual sedimentation basin, where the raw water is treated with the alum solution and the suspended matters allowed to settle out as much as possible before conducting upon the filter beds. It is found necessary to wash the latter two to four times daily. The daily pumpage at present is 400,000 to 600,000 gallons, and the dose of alum used, as nearly as could be estimated, ranges from one to two grains per gallon, the larger amount being required during rainy or windy weather, at which times the pond becomes excessively turbid. The filtered water is bright and clear and our analyses indicate a satisfactory quality.

Respectfully submitted,

C. D. HOWARD,  
*Chemist.*

November 1, 1909.

## INVESTIGATION OF THE LACONIA WATER COMPANY'S SUPPLY.

---

Complaint having been made of a peculiar taste which developed in this supply an investigation was made, with the following result:

*Mr. Frank P. Webster, Superintendent Laconia Water Company, Laconia, N. H.:*

Dear Sir: I beg to submit you the following report relative to my investigation of the source and character of the taste now occurring in your water supply.

I learn that the taste complained of was first noted about three weeks ago in the water supplied on certain streets in Laconia. Samples forwarded for examination at about this time gave the usual favorable analysis. Later, a sample taken from the reservoir showed a slightly unpleasant odor, although the analysis was substantially the same as that of the others. None of these samples were tasted. In the absence of any definite understanding of the matter it was assumed at that time that the trouble might be attributable to some condition existing in the reservoir.

On January 23, I personally investigated the local situation. The taste of the water as drawn from a tap at the Electric Lighting Company's office, also at the Business School, was found to be quite marked, being oily in character, together with a suggestion of leather. It was found that this taste was not so noticeable in the cold, freshly drawn water if swallowed quickly but that if a quantity be held in the mouth a few seconds before swallowing, the oily "after-taste" was brought out with great distinctness. An inspection made of the reservoir revealed no conditions to which any exception could be taken. The latter is well protected, with clean edges, and through holes cut in the ice an apparently clean bottom was observed. The taste was here noticeable, and that this could not be attributable to any condition of the reservoir was demonstrated by the fact that such was also detected in the water as pumped directly from the intake at the pumping station.

The shores of Black Brook, which discharges into the lake about one half mile north of the intake, were examined for a short distance above the railroad. The oily taste was found to be quite absent from the brook water. The latter was plainly noticeable, however, at a spot near the middle of the lake one half or three fourths mile north of the intake, where ice was being cut by the Independent Ice Company.

January 25 samples were taken (a) from the open lake in front of the ice-houses, (b) near intake, (c) just above mouth of Black Brook, and (d) Weirs Channel. The oily taste and odor were found to be very marked in samples (a) and (b) but wholly absent from (c) and (d). The brook water carries somewhat more dissolved organic matter than the lake water. The chemical analyses of the three other samples all indicated water of excellent quality. Biological examinations made of all four samples showed in (d) very few organisms, the sediment consisting mainly of plant detritus. Organisms in (c) not numerous but these were found to consist mainly of asterionella—the number not being sufficient, however, to cause appreciable taste or odor. No protozoa observed. In the case of samples (a) and (b) the concentrates



from sand filtration showed a highly marked odor and taste and the following organisms of the protozoan class were noted: *Uroglena* (numerous), *synura* (numerous) and *dinobryon*.

All of these organisms are notorious for the production of marked odors and tastes, *uroglena* being especially bad in this respect. These characters are due to the elaboration by the organism of an essential oil. In fact I find that the taste may be exactly duplicated by shaking a drop of cod liver oil with a few ounces of water. Boiling for a period of not less than five minutes seems to be sufficient to entirely eliminate both taste and odor.

These organisms are undoubtedly normally present in small numbers in the water of this as of most lakes. Their present abundance may be explained by the almost unprecedented low stage of water now existing, in conjunction with the fact that the rains following the fall drouth washed into the lake an abundant food supply for their sustenance. Unfortunately there is not much probability of improvement until the coming of the spring freshets, which will serve to dilute the water. Meanwhile boiling will eliminate the taste, and if the latter should continue after the ice leaves, the installation of some form of aërating device would undoubtedly result in improvement.

I would recommend that the intake be extended into the lake a little further than at present; not only would this tend to the securing of a little cleaner water, but it is possible that if the latter were drawn from a greater depth much of the present trouble might be avoided, this because of the fact that the organisms referred to are apt to be most numerous nearer the surface.

With regard to the question of deleteriousness of these organisms, or of the minute quantities of oil secreted, it may be stated that such can have no effect upon any normal healthy person, although it is of course to be recognized that any disagreeable taste or odor may sometimes be responsible indirectly and through esthetic conductors, in bringing about some slight disturbance in the case of invalids or those of delicate constitutions. For all such a present remedy is to be found in boiling or thorough aëration of the water.

Respectfully submitted,

C. D. HOWARD,

*Chemist.*

January 27, 1909.

## REPORT ON THE WHITEFIELD SUPPLY.

Question having risen as to certain features in connection with the water-supply of the town of Whitefield, an investigation was caused to be made by the Board. The following report was submitted:

*Dr. G. H. Morrison, Chairman, Board of Health, Whitefield, N. H.:*

Dear Sir: In connection with an inspection made of your water supply August 16, 1909, in reference to means for the exclusion of sewage therefrom, I beg to submit the following report with recommendations:

I find your main source of supply to have its origin in a mountain brook fed by springs. This water is piped to a distributing reservoir located near the base of the mountain at a point about six miles from the village. Lying on the water-shed between the source and the reservoir and possibly one fifth mile above the latter on a moderately sharp slope, is a single farm, the property of Merrill Brothers. In connection with the installation of improvements in the farm house, the question of the proper disposal of the sewage has arisen.

To this end four propositions have been submitted, (1) to allow the sewage and household wastes to flow out upon the surface of the ground, (2) their collection in a cesspool, and (3) and (4), their removal beyond possibility of contaminating the reservoir by means of a sewer,—one plan being to extend such sewer for some distance in a northerly direction so as to discharge into the Cherry Pond water-shed, so-called, the other to run a sewer in a southwesterly direction to a point beyond a certain apple tree and south of the reservoir, at which point it is claimed that a narrow divide of land will serve to divert the sewage sufficiently to prevent its reaching the reservoir.

The first proposition, for obvious reasons, has already been rejected, and the second should not be considered in the form as intended. As regards (3) and (4) I am of the opinion that a sewer in either of the directions indicated would afford a perfectly safe and satisfactory arrangement. The second route as indicated above would of course be the less expensive, and I believe that if such sewer were to be extended well down below the apple tree mentioned and to near the edge of the woods, the latter growth would undoubtedly serve to absorb and render innocuous the matters discharged.

Another plan (and the least expensive) that is quite feasible and should prove very satisfactory, would be to install a modified form of cesspool, or "septic tank." A contrivance of this nature is described in detail by Prof. Fletcher in *Sanitary Bulletin* No. 4, Vol. 3, a copy of which is enclosed herewith. Owing to the sharp pitch of the land and the character of the latter, the effluent drain referred to could be constructed very readily and could, of course, be extended a sufficient distance to assure perfect safety. Points that should be observed in this connection are, the construction of a receiving well of generous size, to cement the latter perfectly tight and to so place the effluent sewer that there would be no possible danger of stoppage from freezing.

Devices of this character are now being very commonly recommended for the disposal of sewage and, with proper construction and care, they serve the purpose very well.

In this connection I desire to call the attention of your Board to the very objectionable condition of affairs involved by the existence of this farm on the water-shed. I am informed that the manure of some forty head of cattle is annually deposited on the slopes above the reservoir. During the spring freshets the tendency is for this material to be washed down more or less into the reservoir, and though it is represented that at such times the reservoir is cut out and draught made direct from the upper source, still, an unsafe condition is involved. In view of the fact that the upper supply is not sufficient and it is found necessary to maintain this distributing reservoir at its present location below the highway, and also in view of the fact that it is represented that the erection of summer cottages on this land in the future is not improbable, the precinct should give careful consideration to the desirability of acquiring this farm and reforesting it.

Respectfully submitted,

C. D. HOWARD,

*Chemist.*

August 20, 1909



---

---

## **BACTERIOLOGICAL EXAMINATIONS.**

---

---





## BACTERIOLOGICAL EXAMINATIONS MADE AT THE STATE LABORATORY OF HYGIENE.

---

During the fiscal period embraced by this report 10,874 bacteriological examinations for the detection of disease were made at the State Laboratory of Hygiene, being nearly five thousand more examinations than ever before made for a like period. It certainly shows the growing appreciation of the medical profession of the efforts being made by the state to assist them in the investigations of certain disease conditions.

In addition to this, and not included in the above figures, there were made several hundred bacteriological examinations of water supplies, for the colon bacillus and other organisms. This latter work was done in connection with chemical examinations, the results of which are given in the reports of the chemist to the different towns and cities, corporations and individuals. The positive results of the examinations for the colon bacillus are shown in this volume, in the tabular report of the examinations of "Water Supplies of Cities and Towns."

Aside from the increased demand for examinations in the bacteriological department, there are other evidences of the profession's appreciation of the work that is being done for them and for the public. There is also a much better understanding than heretofore on the part of the profession as to interpretation and application of the results reported to them.



RECORD OF SPUTUM EXAMINATIONS IN SUSPECTED CASES OF TUBERCULOSIS FOR THE  
FISCAL PERIOD ENDING AUGUST 31, 1910.—*Continued.*

City or Town.	Number cases.	Positive.	Negative.	1-10.	10-20.	20-30.	30-40.	40-50.	50-60.	60-70.	70-80.	80-100.	Male.	Female.	Number Examined.
Enfield.....	10	3	7	1	2	3	2	1	.....	1	.....	.....	3	7	10
Epping.....	9	4	5	.....	2	1	2	.....	2	1	1	.....	3	6	13
Exeter.....	43	4	39	1	9	12	19	5	3	3	1	.....	27	16	50
Farmington.....	18	.....	18	3	3	3	2	2	4	1	.....	.....	8	10	22
Freedom.....	3	.....	3	.....	1	1	.....	.....	.....	1	.....	.....	1	2	3
Fitzwilliam.....	7	1	6	1	1	3	1	.....	.....	1	.....	.....	3	4	8
Franconia.....	2	1	1	.....	.....	.....	1	.....	.....	1	.....	.....	2	.....	2
Franklin.....	76	14	62	2	6	17	15	16	4	11	3	2	40	36	106
Fremont.....	4	1	3	.....	1	2	.....	.....	1	.....	.....	.....	.....	4	4
Gilmanton.....	1	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	1
Goffstown.....	7	2	5	.....	1	2	2	1	.....	.....	1	.....	4	3	10
Gorham.....	9	2	7	.....	.....	1	3	2	1	2	.....	.....	4	5	11
Grasmere.....	30	14	16	.....	3	8	4	4	4	7	.....	.....	22	8	41
Greenland.....	7	1	6	.....	2	.....	2	2	.....	1	.....	.....	4	3	7
Greenfield.....	1	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	1
Greenville.....	7	3	4	.....	3	2	1	.....	1	.....	.....	.....	6	1	7
Groveton.....	6	1	5	.....	2	1	1	1	1	.....	.....	.....	2	4	6
Hampton.....	8	4	4	.....	3	3	2	.....	.....	.....	.....	.....	6	2	14
Hanover.....	67	7	60	1	12	31	13	4	3	3	.....	.....	58	9	85
Haverhill.....	3	2	1	.....	.....	.....	1	1	1	.....	.....	.....	2	1	5
Henniker.....	1	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	1
Hill.....	2	.....	2	.....	1	.....	.....	1	.....	.....	.....	.....	2	.....	3
Hillsborough.....	20	2	18	1	4	1	3	4	3	1	3	.....	10	10	25
Hinsdale.....	10	1	9	1	.....	1	3	1	2	2	.....	.....	5	5	10
Hooksett.....	2	.....	2	.....	1	.....	.....	1	.....	.....	.....	.....	2	.....	3
Hudson.....	2	.....	2	.....	1	1	.....	.....	.....	.....	.....	.....	1	1	4
Keene.....	92	18	74	3	10	20	34	8	6	10	1	.....	40	.....	119
Kingston.....	5	2	3	.....	.....	2	2	.....	1	.....	.....	.....	2	.....	5
Laconia.....	36	11	25	.....	2	16	10	5	3	.....	.....	.....	12	24	45
Lancaster.....	23	7	16	.....	1	12	5	3	1	1	.....	.....	12	11	29
Lebanon.....	39	12	27	1	6	12	9	9	2	.....	.....	.....	14	25	55
Lempster.....	3	.....	3	.....	1	.....	1	.....	1	.....	.....	.....	2	1	4
Lincoln.....	15	6	9	.....	1	5	7	2	.....	.....	.....	.....	9	6	16
Lisbon.....	10	5	5	.....	.....	4	3	1	.....	2	.....	.....	4	6	10
Littleton.....	76	8	68	3	10	16	18	15	10	3	1	.....	45	31	121

RECORD OF SPUTUM EXAMINATIONS IN SUSPECTED CASES OF TUBERCULOSIS FOR THE  
FISCAL PERIOD ENDING AUGUST 31, 1910.—*Continued.*

City or Town.	Number cases.	Positive.	Negative.	1-10.	10-20.	20-30.	30-40.	40-50.	50-60.	60-70.	70-80.	80-100.	Male.	Female.	Number examined.
Londonderry.....	1		1		1								1		1
Loudon.....	2	1	1						2				4	2	2
Lyme.....	11	4	7		4	1	2		2	2			1	7	11
Lyndeborough...	2		2					2						1	2
Madison.....	1		1			1								1	1
Manchester.....	318	84	234	3	38	109	97	36	19	12	4		176	142	368
Meriden.....	6		6	4	1	1								6	7
Milford.....	6	1	5		2	1	1	1		1			2	4	6
Monroe.....	1		1					1					1		1
Mountainville....	1		1			1								1	1
Nashua.....	169	47	122		23	39	42	36	14	10	5		93	76	217
New Boston.....	9	1	8			2	1	2	3	1			4	5	11
New London.....	4	1	3			2	1				1		2	2	4
Newmarket.....	3	2	1			1	1			1			1	2	4
Newport.....	19	8	11		5	5	1	3	3	1	1		11	8	25
Northwood Ridge.	6	3	3		2	2	1	1					2	4	6
Nottingham.....	4	3	1			2		1	1				4		4
Orford.....	3		3			1	1	1					2	1	3
Ossipee.....	1	1				1	1						1		2
Peterborough....	5	2	3	1	1		1		1	1			2	3	7
Pittsfield.....	11	4	7		3	2		2	2	2			5	5	10
Pembroke.....	15	10	5		1	4	5	4	1				6	9	19
Plymouth.....	20	6	14	2	4	5	3	5			1		11	9	33
Portsmouth.....	98	21	77	2	5	29	25	21	6	5	5		39	59	129
Raymond.....	2	1	1			1				1			2		2
Rochester.....	26	4	22	2	4	5	6	6	1	2			14	12	34
Salem Depot.....	1		1	1										1	1
Sandwich.....	8	2	6			5	2				1		4	4	11
Sanbornville....	2	1	1			1	1						1	1	5
Somersworth.....	34	12	22	1	3	9	12	4	2	3			18	16	39
Stewartstown....	5	2	3	1	3	1							2	3	5
Stratford.....	8	1	7		2	1	1	2	1	1			5	3	13
Sunapee.....	4	2	2		1	1	1	1					3	1	5
Suncook.....	34	5	29	1	4	5	5	8	4	4	3		17	17	38
Sutton.....	4	1	3				3						1	3	4



RECORD OF SPUTUM EXAMINATIONS IN SUSPECTED CASES OF TUBERCULOSIS FOR THE  
FISCAL PERIOD ENDING AUGUST 31, 1910.—*Concluded.*

City or Town.	Number cases.	Positive.	Negative.	1-10.	10-20.	20-30.	30-40.	40-50.	50-60.	60-70.	70-80.	80-100.	Male.	Female.	Number examined.
Swansey .....	9	2	7			2	2	2	2	1			5	4	10
Temple.....	1	1							1				1		4
Tilton.....	7	1	6		1	3	1	1		1			3	4	10
Troy.....	12		12		3	2	1	2	2	2			4	8	12
Tuftonborough...	1	1					1							1	1
Walpole.....	6		6		1		2			2	1		4	2	8
Warner.....	8	8			2	2	1	1	1		1		5	3	8
Warren.....	4	2	2		1	1	1	1					2	2	5
Wilton.....	7	1	6				2		3		2	2	5	2	11
Winchester.....	3		3		1	1	1						2	1	3
Whitefield.....	27	4	23		5	10	5	2		5			8	19	28
Wolfeboro.....	13	3	10		5	3	2	1	1	1			2	11	15
Woodsville.....	21	4	17			3	5	8	4		1		7	14	23
Not stated.....	14	1	13	2	2	3	3	1	1	2			7	7	16
Totals.....	2,444	585	1,849	68	313	682	594	368	201	150	61	7	1,008	1,436	3,491

During the period covered by this report 3,491 examinations of sputum were made for the bacillus of tuberculosis, as against 2,238 for the like previous period. The examinations represent 2,444 individual cases.

Of the total number of specimens examined, 585 were positive, 1,849 negative. The ages of the patients, in ten-year periods, and the sex are given in the accompanying table.

The laboratory furnishes free outfits for all the bacteriological work, a supply being kept by a sufficient number of druggists to accommodate the profession. All of the outfits referred to are mailable. The one for collecting sputum is sent out containing a solution of carbolic acid into which the sputum is deposited, the bacilli being immediately killed by it, so that there is no danger of infection in transmitting through the mails or in handling in the laboratory. The instructions sent out with the outfit are as follows:

NEW HAMPSHIRE  
STATE BOARD OF HEALTH.  
LABORATORY OF HYGIENE.

This SPECIMEN will be examined for TUBERCLE BACILLI if ALL QUESTIONS on enclosed card are answered, otherwise not.

Add expectoration discharged in morning to CARBOLIC SOLUTION in sputum cup. PUT CORK IN FIRMLY to avoid leakage.

SPECIMENS WILL NOT BE ACCEPTED UNLESS SUBMITTED IN THE BOTTLES PROVIDED FOR THE PURPOSE BY THE LABORATORY.

SPECIMENS WILL NOT BE EXAMINED IF THERE IS ANY SPUTUM ON THE OUTSIDE OF THE BOTTLE.

Purulent, cheesy and muco-purulent sputum most frequently contain the bacilli; pure mucous, blood or saliva do not as a rule contain the bacilli.

Patient should be told to deposit results of coughing in the specimen bottle, and not merely to spit in the vessel. When hemorrhage has occurred, some purulent, cheesy or muco-purulent sputum should, if possible, be collected for the examination.

PATIENT SHOULD TOUCH BOTTLE AND CORK AS LITTLE AS POSSIBLE. BE VERY SURE THAT PATIENT DOES NOT PERMIT SPUTUM TO COME IN CONTACT WITH OUTSIDE OF BOTTLE OR CORK.

These rules have been adopted because the examination of tuberculous sputum entails some danger to the examiner, if indiscriminate outfits are used or if the material is carelessly collected.

All charges for transmission must be paid by the party sending the specimen; and also telegraph or telephone charges in reporting results. Report will be sent by mail, as soon as possible, unless otherwise ordered.

Send specimen to Concord or Hanover, as may be most convenient.

The card referred to in the above suggestions, is for the purpose of keeping a record in this department, the facts of which may be of value when taken in connection with the hundreds of other similar records. The same is true of the information asked for in other examinations, as in diphtheria, typhoid fever, etc. These records are the confidential property of the State Board of Health, and are used only in making deductions from sanitary work, the name of the patient never being revealed.

No. .... t. ....

TUBERCULOSIS.

Doctor's name.....  
City or town.....  
Patient's name..... Age..... Sex.....  
Occupation..... Is patient able to work?.....  
Number of specimen: 1st, 2d, 3d.....  
Duration of disease..... How many other cases in same household?.....  
Is sputum morning specimen?..... Is it scanty?.....  
Clinical diagnosis.....  
Shall report be sent by mail, telegraph, or telephone?.....

(Remarks may be written on reverse side of this card.)

Received..... Result.....  
Reported..... by.....

Following the examination, a report is made to the physician who sent the specimen. The blank used for the purpose contains the following explanatory note:

If the result of the examination is negative it is not to be assumed that the case is not one of pulmonary tuberculosis, for frequently in this disease tubercle bacilli are at times absent from the sputum and the disease can only be probably excluded if repeated examinations of the sputum fail to show the presence of bacilli. If the first examination in a case is negative, other specimens should be sent for examination.

The demonstration of the presence of tubercle bacilli in the sputum proves conclusively the existence of tuberculosis, but the absence of tubercle bacilli or the failure to find them microscopically does not exclude the existence of the disease.

## EXAMINATIONS IN SUSPECTED CASES OF DIPHTHERIA.

---

Examinations for the Klebs-Loeffler bacillus were made of 3,491 specimens for the purpose of diagnosis, and of 2,500 specimens for purposes of release, the remainder being for school and hospital investigations. Of the number, 761 were positive, 2,730 were negative, and in the school and hospital examinations 17 were positive and 331 negative.

Diphtheria outfits for the use of physicians are deposited in different parts of the state, the same as for tuberculosis. Accompanying the outfit is the following circular.

NEW HAMPSHIRE  
STATE BOARD OF HEALTH.  
LABORATORY OF HYGIENE.

This SPECIMEN will be examined for DIPHTHERIA BACILLI if ALL QUESTIONS on enclosed card are answered, otherwise not.

A diagnosis of diphtheria should not be surrendered until three negative cultures have been reported from the laboratory.

A case of diphtheria should not be released from quarantine until at least two negatives (three are better) have been secured.

Rub the swab thoroughly over exudate or membrane, not forgetting the nose as a frequent source of the bacilli; do this in a good light and at a time when you are sure no antiseptic has been used for at least two hours.

Diphtheria does not occur without the presence of the diphtheria bacilli; but there have been many cases of diphtheria in which, for one or another reason, no bacilli were found in the cultures by the examiner. In many of these cases later cultures revealed them.

If a culture taken from the throat of a patient, who appears, clinically, to have diphtheria, reveals the Klebs-Loeffler bacillus, there can be no question as to the diagnosis; *but should the culture prove negative, instead of positive, the physician should in every instance regard the result as valueless, and should not permit it to warp his judgment or treatment of the case from a clinical point of view.* The physician who relies upon a primary negative result for a diagnosis of his case may find himself in serious trouble, with, perhaps, a most malignant type of diphtheria on his hands a few days later.

The laboratory does not in any instance give a diagnosis of the case; does not see the patient; knows nothing of his symptoms. It simply reports "positive" or "negative" as the result of a most careful and scientific examination of the *material received*. The report is made *upon the swab*, and not upon the throat condition which prompted the sending.

This mailing case, approved by the U. S. Postoffice Department for sending pathological specimens by mail cannot be furnished physicians to be kept in stock at their offices on account of the great expense of such a distribution. These outfits will be kept at convenient stations for the use of the physician (of which he will be informed), or will be sent by mail upon application when needed for *immediate* use.

A record will be kept of every outfit, and the party receiving same will be held accountable for it.

Every specimen reaching Concord not later than nine o'clock in the evening (Sundays included) will go into the incubator at once so that a report can be made early the following morning.

Report will be sent by mail, as soon as possible, unless otherwise ordered.

Send specimen to Concord or Hanover, as may be most convenient.

The record card, which the physician must return with the specimen to be examined, is as follows:

## DIPHTHERIA.

No.....

Questions below must be answered in every case.

Doctor's name.....City or Town.....  
 Patient's name.....Age.....Sex.....  
 Residence.....Date of earliest symptoms.....  
 Date Culture taken?.....For Diagnosis?.....For Release?.....  
 Is there membrane or exudate?.....Where?.....  
 Was an antiseptic applied to throat within two hours?.....(If so the  
 chance of diagnosis from swab is greatly diminished.)  
 Clinical diagnosis.....

Send specimen by mail to Concord or Hanover, as may be most convenient.

Shall report be sent by mail, telegraph or telephone?.....

Received by.....Result.....  
 Reported.....by.....

This card, like that which accompanies other outfits, is for record and statistical purposes.

The following table gives the total number of examinations made, by towns, with results:



RECORD OF EXAMINATIONS MADE IN SUSPECTED CASES OF DIPHTHERIA DURING THE  
TWO YEARS ENDING AUGUST 31, 1910.

City or Town.	Diagnosis.	Positive.	Negative.	Release.	Positive.	Negative.	Total.
Alton.....	2	1	1	5	0	5	7
Alstead.....	1	0	1				1
Andover.....	13	5	8	6	1	5	19
Antrim.....	5	3	2	3	1	2	8
Amherst.....	4	1	3	14	4	10	18
Auburn.....	2	2					2
Barnstead.....	1		1				1
Bartlett.....	6	1	5	3		3	9
Belmont.....	17	7	10	28	3	25	45
Berlin.....	8	2	6	6		6	14
Boscawen.....	8	2	6	1		1	9
Bristol.....	8	3	5	6		6	14
Brookline.....	4	1	3	8	3	5	12
Bedford.....	2		2				2
Campton Village.....	1		1				1
Canaan.....	1		1				1
Candia.....	5	1	4	19	3	16	24
Center Harbor.....	2		2				2
Charlestown.....	17	4	13	6	4	2	23
Chester.....	7	1	6	5	0	5	12
Claremont.....	21	2	19	3		3	24
Concord.....	1,455	219	1,236	898	310	588	2,353
Colebrook.....	1		1				1
Conway.....	4	1	3				4
Deerfield.....	1		1	3		3	4
Derry.....	59	23	36	41	16	25	100
Dover.....	30	3	27	4	1	3	34
Dublin.....	1		1				1
Durham.....	2	1	1				2
Effingham.....	1		1				1
Enfield.....	5		5				5
Epsom.....	5	1	4	9	1	8	14
Epping.....	2		2	4		4	6
Exeter.....	7	2	5	17	7	10	24
Farmington.....	11	11		3		3	14

RECORD OF EXAMINATIONS MADE IN SUSPECTED CASES OF DIPHTHERIA DURING THE  
TWO YEARS ENDING AUGUST 31, 1910.—*Continued.*

City or Town.	Diagnosis.	Positive.	Negative.	Release.	Positive.	Negative.	Total.
Francetown.....	1		1	2		2	3
Franconia.....	1		1				1
Franklin.....	45	12	33	159	33	126	204
Gilmanton.....	1		1				1
Goffstown.....	3		3				3
Groveton.....	5	1	4	5	1	4	10
Grasmere.....	16	1	15	5	1	4	21
Greenfield.....	4	4					4
Greenland.....	23	7	16	26	4	22	49
Hampstead.....	13	4	9	21	6	15	34
Hampton.....	3		3	1		1	4
Hanover.....	36		36				36
Haverhill.....	7	1	6	1		1	8
Hillsborough.....	26		26	1		1	27
Hinsdale.....	2		2	1		1	3
Hollis.....	1		1				1
Hooksett.....	3	1	2	3		3	6
Hopkinton.....	2	1	1	1		1	3
Hudson.....	2		2	1		1	3
Jaffrey.....	4	2	2	2		2	6
Keene.....	258	66	192	216	63	153	474
Laconia.....	85	25	60	96	28	68	181
Lancaster.....	6	2	4	1	0	1	7
Lempster.....	7	2	5	18		18	25
Lebanon.....	27		27	4	1	3	31
Lincoln.....	14	5	9	9	2	7	23
Lisbon.....	18	3	15	2		2	20
Littleton.....	68	26	42	102	27	75	170
Londonderry.....	3	1	2	3		3	6
Loudon.....	14	6	8	16	2	14	30
Lyme.....	9	1	8	4	1	3	13
Manchester.....	331	82	249	203	62	141	534
Marlborough.....	1		1				1
Madison.....	2		2				2
Meriden.....	3		3				3

RECORD OF EXAMINATIONS MADE IN SUSPECTED CASES OF DIPHTHERIA DURING THE  
TWO YEARS ENDING AUGUST 31, 1910.—*Concluded.*

City or Town.	Diagnosis.	Positive.	Negative.	Release.	Positive.	Negative.	Total
Milford.....	58	15	43	71	13	58	129
Monroe.....	11	6	5	18	11	7	29
Mont Vernon.....	3	1	2	2	1	1	5
Milton.....	3	3	.....	11	3	8	14
Nashua.....	165	43	122	96	24	72	261
New Boston.....	3	1	2	2	.....	2	5
New London.....	10	1	9	3	.....	3	13
Newport.....	26	10	16	19	10	9	45
Orford.....	7	2	5	.....	.....	.....	7
Peterborough.....	29	13	16	31	14	17	60
Pittsfield.....	3	.....	3	.....	.....	.....	3
Plaistow.....	4	2	2	.....	.....	.....	4
Plymouth.....	21	5	16	10	.....	10	31
Portsmouth.....	162	47	114	137	39	98	298
Rochester.....	22	7	15	17	4	13	39
Rye.....	2	.....	2	4	1	3	6
Suncook.....	54	17	37	18	.....	18	72
Sutton.....	3	1	2	2	.....	2	5
Swanzey.....	5	3	2	.....	.....	.....	5
Tilton.....	11	3	8	24	10	14	35
Troy.....	11	1	10	.....	.....	.....	11
Wakefield.....	4	1	3	.....	.....	.....	4
Walpole.....	13	5	8	13	3	10	26
Warner.....	15	1	14	3	.....	3	18
Warren.....	1	.....	1	.....	.....	.....	1
Wentworth.....	5	.....	5	.....	.....	.....	5
Whitefield.....	3	1	2	.....	.....	.....	3
Wilton.....	11	4	7	7	.....	7	18
Winchester.....	29	2	27	.....	.....	.....	29
Wolfeboro.....	6	2	4	.....	.....	.....	6
Woodsville.....	19	4	15	27	7	20	46
	3,491	761	2,730	2,500	725	1,775	5,991
Concord School.....	300	17	283	.....	.....	.....	300
New Hampshire State Hospital.....	48	.....	48	.....	.....	.....	48
							6,339

## EXAMINATIONS IN SUSPECTED CASES OF TYPHOID FEVER.

---

Blood specimens from 766 suspected typhoid fever patients were made during the year, of which 221 were positive, and 545 negative. The towns from which the specimens were received, together with results in detail, are shown in the following table. The directions accompanying the typhoid outfits are as follows:

### DIRECTIONS FOR TAKING BLOOD SAMPLE.

Cleanse the skin of the finger tip or the lobe of the ear of the patient. After drying, prick with a sterilized needle. A surgeon's needle is best for this purpose, and the flow of blood from the finger may be aided if a string is wrapped tightly around it a short distance from the tip, before the pricking. *Wait till a large drop of blood has appeared before using the pipette*, which will be found in the block. Draw the drop of blood into the capillary tube for about an inch or more, and then hold the tip of the tube in the flame of a lighted match until it appears red hot. This will fuse the glass and seal the tube. Do not heat the tube far up as this will destroy the blood.

Fill out the accompanying card and replace in the envelope; seal, and return to the laboratory by mail. (Postage two cents.)

All charges for transmission must be paid by the party sending the specimen; and also telegraph or telephone charges in reporting results. Report will be sent by mail, as soon as possible, unless otherwise ordered.

RECORD OF BACTERIOLOGICAL EXAMINATIONS IN SUSPECTED CASES OF TYPHOID FEVER  
DURING THE TWO YEARS ENDING AUGUST 31, 1910.

City or Town.	Number cases.	Positive.	Negative.	Male.	Female.	Number sent.
Albany.....	1		1	1		1
Alton.....	1		1	1	0	1
Andover.....	3	2	1	2	7	4
Antrim.....	3	3		2	1	3
Ashland.....	1		1	1		1
Bartlett.....	2	1	1	2		2
Belmont.....	1		1	1		1
Berlin.....	19	6	13	17	2	19
Bristol.....	3		3		3	3
Brookline.....	1		1		1	1
Bradford.....	1	1	0		1	1
Campton.....	1	1		1		1
Centerville.....	2	1	1		2	2
Charlestown.....	4	1	3	2	2	4
Claremont.....	53	13	40	28	25	57
Concord.....	162	46	116	105	57	168
Conway.....	2		2		2	2
Deerfield.....	1	1		1		1
Derry.....	9		9	6	3	9
Dover.....	19	2	17	11	8	21
Epping.....	8	5	3	3	5	8
Exeter.....	9	1	8	5	4	9
Farmington.....	21	6	15	7	14	21
Franklin.....	46	11	35	20	26	46
Gilsum.....	1		1	1		1
Goffs Falls.....	2	1	1	1	1	2
Goffstown.....	3		3		3	3
Greenfield.....	2		2	1	1	2
Hampton.....	6	1	5	6		6
Hanover.....	26	11	15	17	9	26
Hartford, Vt.....	1	1			1	1
Haverhill.....	4	1	3	4		4
Henniker.....	2		2	2		2
Hooksett.....	2		2	2		2
Hudson.....	1		1	1		1



RECORD OF BACTERIOLOGICAL EXAMINATIONS IN SUSPECTED CASES OF TYPHOID FEVER  
DURING THE TWO YEARS ENDING AUGUST 31, 1910.—*Concluded.*

City or Town.	Number cases.	Positive.	Negative.	Male.	Female.	Number sent.
Hillsborough.....	9		9	6	3	9
Keene.....	33	11	22	22	11	33
Lancaster.....	1	1	0	1		1
Laconia.....	10	4	6	4	6	10
Lebanon.....	33	8	25	8	25	33
Lempster.....	2	1	1		2	2
Lincoln.....	8	3	5	5	3	8
Littleton.....	15	6	9	7	8	15
Londonderry.....	1		1	1		1
Manchester.....	54	11	43	35	19	54
Meriden.....	1		1		1	1
Milton.....	1		1	1		1
Mont Vernon.....	1		1	1		1
Nashua.....	25	4	21	13	12	25
New London.....	5	2	3	4	1	5
Newport.....	5	2	3	1	4	5
Ossipee.....	3		3	3		3
Peterborough.....	1	1		1		1
Pittsfield.....	1		1		1	1
Plymouth.....	39	18	21	31	8	39
Portsmouth.....	24	4	20	17	7	24
Randolph.....	1		1	1		1
Rochester.....	5	3	2	4		5
Springfield.....	1		1	1		1
Stewartstown.....	4	2	2	4	1	4
Stratford.....	3	1	2	3		3
Suncook.....	8	2	6	5	3	8
Sutton.....	1	1			1	1
Troy.....	3	1	2		3	3
Walpole.....	7	1	6	6	1	7
Warner.....	6	2	4	6		6
Wilton.....	25	15	11	16	10	25
Wolfeboro.....	2		2	1	1	2
Woodsville.....	4	1	3	3	1	4
	766	221	545	462	304	798

MISCELLANEOUS EXAMINATIONS.

Examined for	Positive.	Negative.	Total.
Tubercular tissue.....	4	8	12
Feces tubercular.....		8	8
Streptococci .....	2	8	10
Malaria.....	3	17	20
Gonorrhœa.....	73	123	196

---

**A BRIEF ON WAYS AND MEANS OF HAVING  
HEALTHY HOMES AND SUMMER RESORTS.**

---



## FOREWORD.

The science and art of sanitation have made notable advances in the state and nation, since the New Hampshire Board of Health made its first report to the legislature in 1882. The leading cities and villages of the state have provided for themselves water-supplies and sewerage systems more or less adapted to their needs. In regard to the disposal of household wastes on a small scale, the annual reports and quarterly bulletins have abounded in suggestions, descriptions of various work done, timely information and instruction. Papers or bulletins on "Disposal of Household Wastes at Summer Resorts," etc., "The Septic Tank, Bacteria Bed and Economical Disposal for Small Communities," "A Sand Filter for Domestic Water Supply," "An Unhampered Cesspool" and others, have been printed in editions of considerable size and widely distributed. But some smaller communities and country districts are still backward. Many still believe in the old-fashioned cesspool; or, whether they believe in it or not, do not or will not see any better way; especially if it calls for any extra labor or expense. The ways of the grandfathers are good enough for them. The state inspector going in almost any direction from the capital finds wells in the barnyards, and other wells, springs, ponds and streams manifestly receiving pollution from household drainage. The summer visitor searching for things "colonial" has no difficulty in finding the colonial privy still flourishing and obtrusively "conserving" the ancient odors for posterity.

In the exercise of its authority, when requiring the abatement of unsanitary conditions, the board finds it desirable and even necessary to do more than prepare and promulgate rules and regulations. Local boards of health who have to enforce such regulations call for specific information and instructions as to the proper methods and appliances suited to their own problems. When reluctant owners are facing legal compulsion, they naturally inquire: "What can we do?" "What are the ways and means which will satisfy this new sanitary standard?" "What is the *least* that I must do, and what will it cost?" Some of these inquiries are for information on points not covered by the previous publications, the editions of which are now exhausted. Hence it seemed to be expedient to issue a larger pamphlet which shall not only reiterate the more important information and suggestions given heretofore, but present also some general plans, specifications and directions adapted especially to the needs of house-owners with small means and neighborhoods with scanty resources. Accordingly the civil engineer member of the board,—Prof. Robert Fletcher, member of the American Society of Civil Engineers and director of the Thayer School of Civil Engineering, Dartmouth College,—was requested to prepare such a paper.

But it must be understood that this is not intended to usurp the functions of a civil engineer or other competent advisor. Such plans and specifications will generally need some modification to be suited to a particular situation. The majority of people cannot understand even very plain drawings of this sort. Errors may arise from misinterpreting the plans, making the excavations too much or too scant, getting the grades wrong, using bad or unsuitable materials, careless or dishonest workmen giving imperfect construction, etc. If it be true that "He who tries to be his own lawyer has a fool for a client," it is even more true for a novice who tries to do a nice piece of construction for which he lacks the proper knowledge and skill. The present publication aims to give only preliminary advice and information, and



to set forth the principles and some of the proper methods for dealing with household wastes when not in great quantity. At the same time, the plans are given in sufficient detail, so that intelligent persons in situations like those assumed, who follow them carefully, may find them immediately useful.

No consideration is given to sand filter-beds, contact beds, complete installations of septic tanks, percolating beds and sprinkling methods, because these are generally provided for operations on a large scale demanding considerable expense, and can be built only under expert advice and direction.

## DISPOSAL OF HOUSEHOLD REFUSE IN SMALL COMMUNITIES.

By ROBERT FLETCHER, Member American Society of Civil Engineers; Member of the State Board of Health.

The man of some past generation who first constructed a kitchen drain and a cesspool probably considered himself a "reformer" as against his neighbors who continued to throw their kitchen slops about the dooryard. At least he put the liquid waste "out of sight, out of mind,"—for a time. And yet he may not have been very ancient, for the late Col. George E. Waring wrote in 1876: "The art of sanitary drainage may almost be said to have been born—or reborn—but a quarter of a century ago." This backward glance doubtless refers to the time when, in the words of another:\* "The old-fashioned backhouse had no rival, and, on the grounds of rich and poor alike, bore its silent witness to the radical equality of mankind." Certainly it is now much less than a century since "sanitary reformation" was widely agitated in Great Britain. It must be remembered that the general use of the water-carriage system of disposal was impossible before the days of modern water-works, giving more abundant supply to a far greater number of people than ever before known. In the earlier days, systems of dry disposal were much practised, such as the pail system, dry-earth closet and improved privy vault. In England, the latter were sometimes lined with brick or glazed earthenware. The pail system, as formerly managed in Birmingham, Rochdale and other English cities, required a large, well-organized force of scavengers with wagons for removing the tubs. These were big enough so that removals were made weekly, and some of the tubs were lined with absorbent material. In Rochdale, in 1876, the number of tubs had increased to more than 5,500. The cumbrous details and other disadvantages of such a system are obvious, and, in the larger cities, it was soon outgrown. But the need for some such method or methods, for single homesteads with no recourse to better means, is and must ever be well-nigh universal. It will be appropriate, therefore, in the sequel of this paper, to review briefly and give specifications for ways and means of sewage disposal without water-carriage.

### DISPOSAL OF WATER-BORNE SEWAGE.

#### THE CESSPOOL AND SOIL POLLUTION.

Our ancestral friend with his first cesspool doubtless soon realized the need of further reformation. If he did not find the ground "sewage sick" after a few years, his descendants did. Yet there are thousands of good people who still think that the ground will continue to absorb and purify such liquid foulness and that Nature may be depended upon to save them from evil consequences. Many such people

\*The late Dr. William T. Smith of the Dartmouth Medical College.

or members of their families are in ill health and sometimes die, because they will not believe that the causes lie close at hand and might easily be removed.

The charge against the cesspool has been thus stated: "The old-fashioned privy vault and cesspool cannot be too strongly condemned. Constructed for the avowed purpose of retaining the solid matters as long as possible upon the premises, they become centers of pollution and infection. The liquid portions, escaping, pollute the soil and neighboring wells; the noxious exhalations arising from their putrefying contents contaminate the air."\*

He then cites the following facts: "At Charlbury, in consequence of the escape of the contents of a barrel of petroleum or benzoline, which had been buried in an orchard, a circuit of wells sixty feet below and 750 to 900 feet distant became so affected that the occupiers of fifteen houses, containing eighty-two people, were for ten days unable to use the water for drinking or cooking. Cattle refused to drink at the 'spring,' where they were accustomed to drink. Had this soakage been sewage instead of petroleum, who can doubt that the result might have been wholesale water-poisoning and an outbreak of typhoid fever."

In Munich, from 1854 to 1859, when porous cess pits were everywhere, and there were no regulations for keeping the soil clean, the mortality per million due to enteric fever was 24.2 yearly; from 1860 to 1865, when the bottoms and sides of porous pits were required to be cemented, the mortality decreased to 16.8; from 1866 to 1873, when there was a system of partial sewerage, to 13.3; and from 1876 to 1880, under complete sewerage, only 8.7. Pages of similar instances might be cited, but enough has been stated.

By official action of the State Board of Health of Virginia the following are declared nuisances dangerous to the public health and as such shall not be permitted to exist:

1. A dry closet in which the compartment containing the excrement is not water-tight or fly-proof, or in which the excrement is allowed to run on the ground or be exposed to flies, or in which the excrement is not removed or buried at least once a month.

2. A cesspool, vault or tank, containing sewage, and not water-tight or fly-proof.

3. A drain or sewer which empties, without purification, so that the contents can gain access to a well, spring or stream from which water is obtained for drinking purposes.

The main difficulty with the common cesspool is *stagnation*. But, in spite of man's neglect, Nature has always performed in them certain processes of "digestion" or reduction, by which the contained solids have been converted wholly or partly into liquid and gas. If records had been made, doubtless many instances could be given where the contents have been found to be almost wholly liquid after continued use. The experience of the writer to this effect is given beyond in connection with a method proposed for mitigating or removing the nuisance from old cesspools and giving respectability to their surroundings. At Lake Sunapee, N. H., a cesspool at the railroad station, which had been in use ten years, was opened a few months ago and practically no deposit found in it. This was 9 feet long, 3 feet wide and 7 feet deep and was covered with two to three feet depth of earth. Other like cases have come to the notice of members of the board.

In the vicinity of Chicago an entire suburban district has been equipped with what the engineer terms residential septic tanks, which are simply cesspools with stop boards or baffles across the top, but having outlets into agricultural drains. These were based upon the engineer's experience of twelve years with a cesspool which

\*Samuel M. Gray, C. E., in report to the City of Providence, R. I.

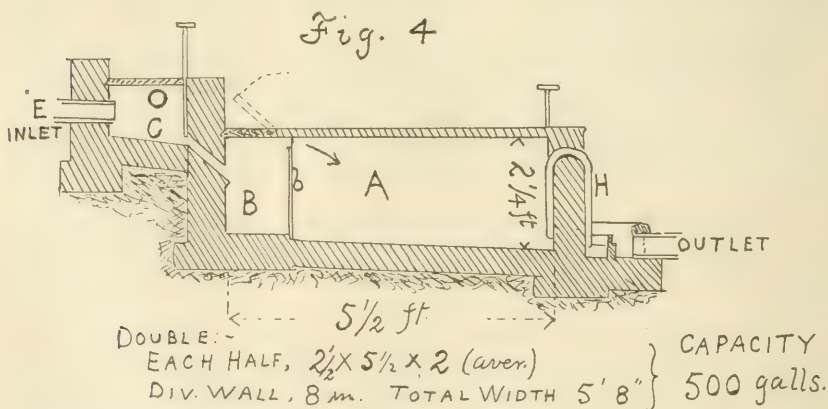
accumulated but little sludge in all of that time.\* A Canadian engineer has had similar experience and has used a similar method in his practice.†

The appurtenances for taking care of water-borne sewage on a small scale may be described under the following heading:

### THE MODIFIED CESSPOOL OR SEWAGE TANK WITH SUBSURFACE DISPOSAL.

As we give our attention to considering a better way, it may be well to notice first how the English took hold of the problem.

In 1874, a report was made in England on the working of Denton and Field's "Sewage Meter," in Eastwick, a hamlet of fifteen houses not far southwest of London. The population served was 145. As the water supply was scant, only five water closets (for the larger houses) were used. The cottages were served by "improved" privy vaults. A longitudinal section of the tanks is shown in the sketch herewith. C is the grit chamber, into which the drain pipes, E, discharged from two directions or more. After settling in C, the sewage passed into B; thence over the partition, b, into the "meter" A. When the latter was full, it was emptied automatically by the siphon H into a basin from which it flowed through pipes to irrigate a garden. The capacity of the tank, which was made double so that half might always be in use, was 500 gallons, including all compartments. It filled and discharged in ordinary dry weather three times in two days.



The irrigation feature proved very successful, but the climate there is much more favorable for that than would generally be found in the northern part of the United States.‡ The Eastwick tank is interesting historically, because it was officially declared to give entirely satisfactory results for a small community under the conditions stated; also because its arrangement and action were similar to those of more recent tanks.

It is evident that the operation of this tank was quite different from that of the cesspool. For the gorged cesspool simply overflows when fresh material enters; while the larger compartment of the tank was almost entirely emptied by the siphon, whenever it became full. This gave too little time for the process of digestion or

\*Paper by Burton T. Ashley, reported in *Engineering News*, January 31, 1907, page 119.

†H. F. Shade of Vancouver, *Engineering News*, February 20, 1908.

‡The foregoing description is condensed from Waring's "Sanitary Drainage of Houses and Towns," The Riverside Press, 1876.



reduction which is accomplished in the cesspool, but gave much better distribution on the land.

The proper cesspool or sewage tank must be *designed* or *contrived* according to certain general considerations which may now be stated:

*Size.* The Eastwick tank *metered* or measured out 1,500 gallons in two days, showing that the 145 people used only about five gallons each per day. In a country district with quite a moderate water supply, this might serve as a basis. But in small towns or villages in this country, where the supply is freely used, the ordinary family not addicted to waste, the "washing" being done at home, will use from twenty-five to thirty gallons per person per day. The writer has found this by repeated observations by meters, even when a "flat rate" was charged, so that there was no incentive to economize. In summer resorts, when a fairly abundant supply is available, perhaps fifteen to twenty gallons per person daily for all uses on the place is more nearly correct, according to observations at some mountain hotels in New Hampshire. It is safe to assume twenty-five gallons per person per day as an *extreme* allowance, where the proprietors have to provide the supply. This takes account of the large use in the laundry. Tests have shown that the operation of such tanks is satisfactory, when a quantity equal to its full capacity is discharged in from twenty-four to thirty-six hours; and that it is not detrimental to allow a quantity of three to four times its capacity to flow through in one day. This considerable variation in the rate of flow does not cause deposits of sludge to occur too rapidly. Moreover, in summer resorts, where the number served has wide extremes between summer and winter, if the tank is built double, one half may work efficiently for the least number and the two together be sufficient for the greatest.

*Note the important principle* that rainwater must be excluded. House sewage is quite dilute enough, especially with the inclusion of the water from the laundry.

In view of these facts, a single family of not more than ten or twelve persons would not really need a tank of more than 350 gallons' capacity at the utmost. One of half this size would be ample, but it is not worth while to build a tank smaller than 3 feet wide, 4 feet long and 4 feet in depth of fluid contents. On this basis we may suggest the following:

TABLE OF SIZES FOR SINGLE AND DOUBLE TANKS.

Width.		Length.	Depth.		Contents.		Persons Served.	Quantities.		
Single.	Double.		Wall.	Liquid.	Cubic Feet.	Gallons.		Earth excavation, cubic yards.	Masonry, cubic feet.	Figure.
3	.....	4	5	4	48	360	8 to 16	13	234	5
3½	.....	5	5¼	4½	79	590	12 " 30	.....	.....	.....
4	.....	7	5¾	5	140	1,050	40 " 120	25	420	6
4	.....	10	5¾	5	200	1,450	70 " 240	.....	.....	.....
.....	8	10	5¾	5	400	2,900	70 " 500	.....	.....	.....
4	.....	12	5¾	5	240	1,800	100 " 350	.....	.....	.....
.....	8	12	5¾	5	480	3,600	100 " 700	50	680	7
4½	.....	18	5¾	5	405	3,038	125 " 500	Less if concrete is used.		
.....	9	18	5¾	5	810	6,076	125 " 1,000			
5	.....	21	6¼	5½	577	4,330	200 " 700			
.....	10	21	6¼	5½	1,155	8,660	200 " 1,400			

As these figures make the smaller single tanks disproportionately short, the ends may be rounded as shown in the sketches, which will make the capacity a little larger. Generally it is not advisable to have less than five feet depth of liquid in the tank, and Figs. 5 and 8½ might be modified accordingly. Some authorities provide from one half to one square foot of *liquid surface* for each person served. By that rule the second numbers in eighth column are too large, after the first two. But the large numbers are *only allowable for a short time*, anyway.

*Material.* Where field stone abounds, rubble walls built of selected smaller stones laid water-tight with mortar of Portland cement (1 part) and clean sand 2½ (parts), and plastered inside to make a smooth finish, are economical. If brick are easily procured, brick masonry may be preferable. If broken stone or good gravel (which must be screened to exclude all stones larger than 2½ inches in diameter) are conveniently at hand, concrete is an ideal material, because it can be poured within wood forms fitted to give any shape and thickness desired; but it must be made and placed by an experienced workman. If the ground is firm enough to stand plumb in the trench, the concrete can be placed directly against it, so that only the inside plank forms would be needed. Concrete walls may be made thinner and stronger if reinforced with wire fencing or expanded metal, but, in small construction this is hardly worth while unless done by one who knows how. The proportions for suitable concrete for this work are 1 part cement, 2 of *clean* sand and 4 of screened stone or gravel; but, to know the proper amount of water and how to work it in the mould so as to secure smooth surfaces, one must have experience.

The main cover which supports the earth over the tank may be of reinforced concrete slabs or of large flat stone as most convenient. Concrete slabs convenient to handle may be made in shallow, tight boxes of rough boards 4 inches deep, long enough to cover the width of the tank (4 to 6 feet) and only 24 to 30 inches wide so as not to be too unwieldy. The concrete should be of the proportions just stated, and the reinforcement may be *old barbed wire* or small rods 3 inches apart or old wire mesh placed within one inch of the under side of the slab. These should be allowed to set two weeks before removing the boxing, and then placed with great care. With less labor, they may be built in place over the tank on a rough but tight floor, well propped from below, level with the top of the walls, and with 2 x 4 pieces on the walls for forming the edges.

*Arrangement.* It is common practice to have the sewage first enter a vestibule known as the grit chamber or settling basin. This may be omitted, *if* the house drains and all fixtures are so well designed and guarded that no sand or garbage or rags can gain entrance. Under such conditions, it may well be omitted from single tanks; but, for double tanks, it serves as a basin from which to direct the flow to whichever half is in use. Accumulations may be more easily detected in and taken from the smaller basin; but, if the coarse stuff is not in large amount, it may be less troublesome to let it go directly into the large tank and remove it all at once. The need of this will not be frequent, if the process proceeds properly. The end of the inflow pipe should be submerged in either case, so that gases of decomposition may not pass up through the house drains and other fixtures.

The drawings show that this system is better adapted to sloping ground. Although the outflow and inflow may be at the same level, the effluent should have some fall so as to absorb air in the outlet chamber. It is far better also not to allow it to trickle away with the same irregularity that the inflow has, but to collect it in a siphon basin from which, when full, the entire contents will be emptied at one flush. This secures much better distribution and action in the drainage trench beyond.

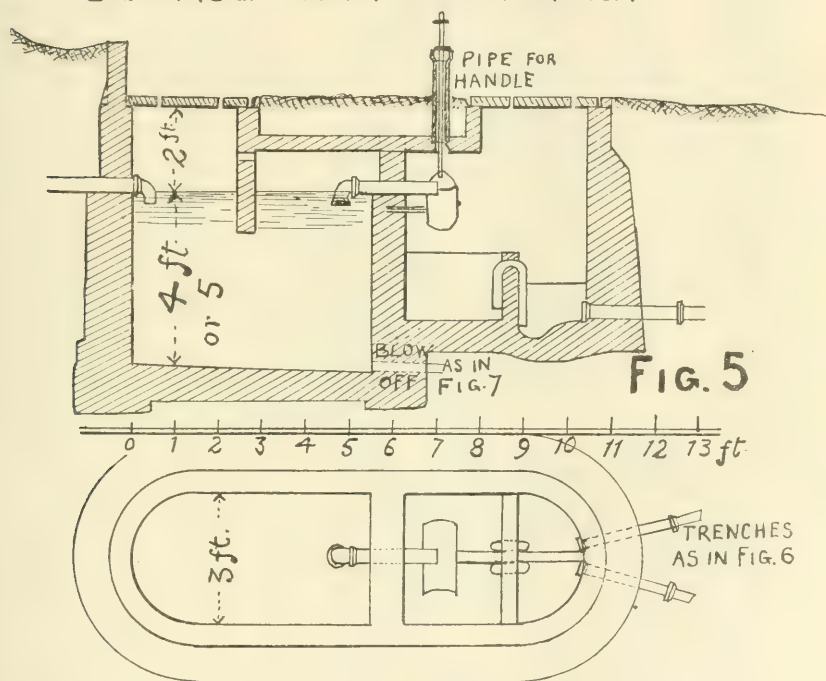
*Distance and Depth.* The distance from the house will depend partly on the slope



of the ground surface. Usually the tank will not be offensive, or (since it is intended to be entirely below the surface) even noticeable, if placed within thirty feet of the house or nearer; but more than fifty feet, or as much farther as is convenient, would probably be more satisfactory. Evidently the inlet must be lower than the point where the pipe comes through the basement wall of the house. The disadvantage of very level ground is that the tank must be so deep that it cannot be emptied by a blow-off pipe, but must be pumped out, or may be mostly emptied by a siphon, if that is found to be necessary; also that the depth would increase with the distance. Sloping ground will usually allow wide choice of location, far or near.

The quantities of excavation are figured on the assumption of walls 16 inches thick at the base, 8 inches at top and 9 to 12 inches above the liquid surface; with

## SEWAGE TANK FOR A FAMILY



the top of the wall near the original surface of the ground. Tank bottom 8 to 12 inches thick according to size. The dimensions may be a little more or less, according to the kind of masonry. It is assumed that the depth of covering will be 12 or more inches. The curb walls are carried up to support the removable covers over the inlet and outlet ends. These curbs and covers may be made of plank, but that material would soon decay in such a place.

The sketches represent three sizes of tanks. Fig. 5 shows one for an ordinary household. All essential dimensions are given; others may be inferred from the scale of the drawing. No settling basin is shown, but, if the builder prefers to have one (supposing he does not exclude rubbish from the house fixtures), it would be attached

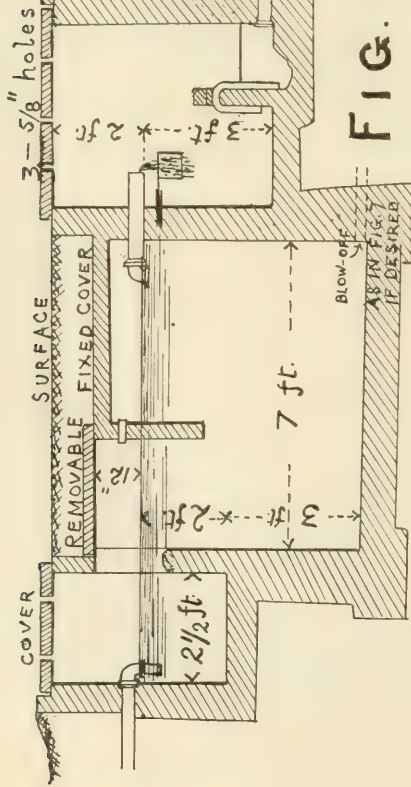
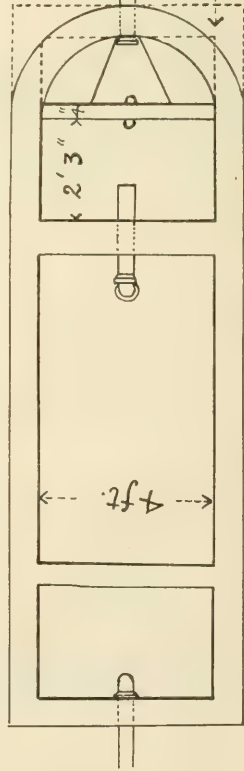
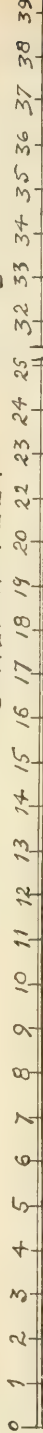


FIG. 6

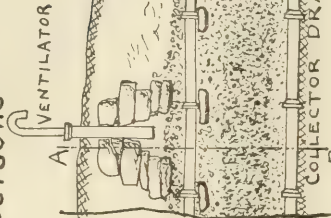
SCALE OF FEET



BRANCH DRAIN  
DISTRIBUTING PIT  
FOR TRENCHES  
-SEE DESCRIPTION  
AND FIG. 8

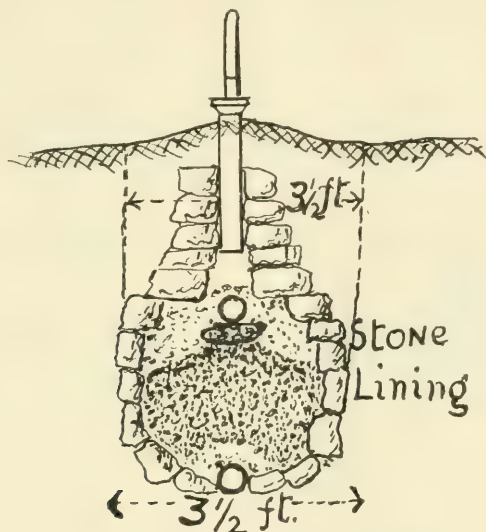
16 To 24 ft.  
According to Size of Tank

# SEWAGE TANK AND FILTER TRENCHES 40 to 120 persons



as in Fig. 6. A twelve-inch wall ought to suffice at the *rounded* ends, but it is safer to have the straight walls 16 inches thick at base; all may taper to 8 inches or less at top. If the earth is not firm, when the tank is empty there may be a great push to crowd the walls inwards. The stop-wall or strut-wall across the top, in this as in other cases serves as a brace. It may be supported on iron bars or old pipe coated with cement mortar; but reinforced concrete is better and more durable.

Fig. 6 represents a larger tank with settling basin, main tank and outlet well complete. This is suggested for a group of houses or for a small summer hotel. The trench is shown single for a distance varying from 16 to 20 feet or more, and terminating in a gravel-filled pit from which two filter trenches may be carried as far as is necessary to get an inoffensive effluent. In most cases it is better to have twin trenches



CROSS SECTION  
OF  
GRAVEL TRENCH  
ON A-B

FIG. 6½

start from the siphon well as shown in Fig. 7; thus one can be in use, while the other has a period of rest.

Fig. 7 shows a larger tank adapted to the needs of a small village or a large summer hotel. Either half may be used separately or both together according to the demand. If the whole is used for the minimum number of people, the storage in the tank may be too long and the effluent objectionable. Note arrangement of two-inch pipes and gate-valves in Figs. 7 and 7½ for possible emptying of the tanks or either one.

*Be it observed* that the general intent in all of these cases is to secure such transformation of the sewage and its effluent that the outcome will not be offensive or dangerous. If the ground has considerable slope, the liquid may partly appear upon

the surface. But a stone-filled pit at the end may largely absorb it, *if a sufficient number of radiating trenches and pits is provided.* Under favorable conditions, the effluent may never be apparent. Spruce, balsam or other trees set far enough away (40 to 50 feet) so that the roots will not creep into the trenches will much relieve any soaking of the ground; but grass is among the greatest absorbers and evaporators of ground water. Moreover, concerning all the parts and appurtenances, the aim

# SEWAGE TANK (DOUBLE) FOR 150 TO 500 PERSONS

LONG. SECTION

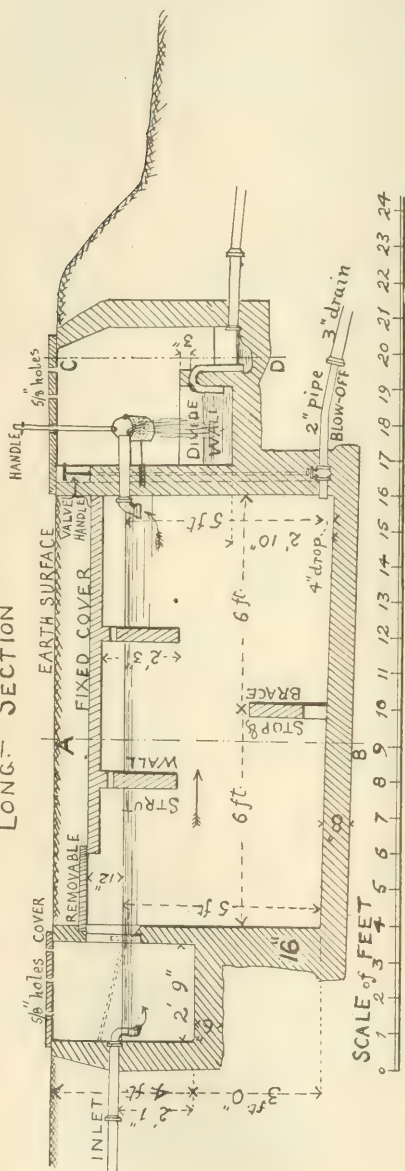
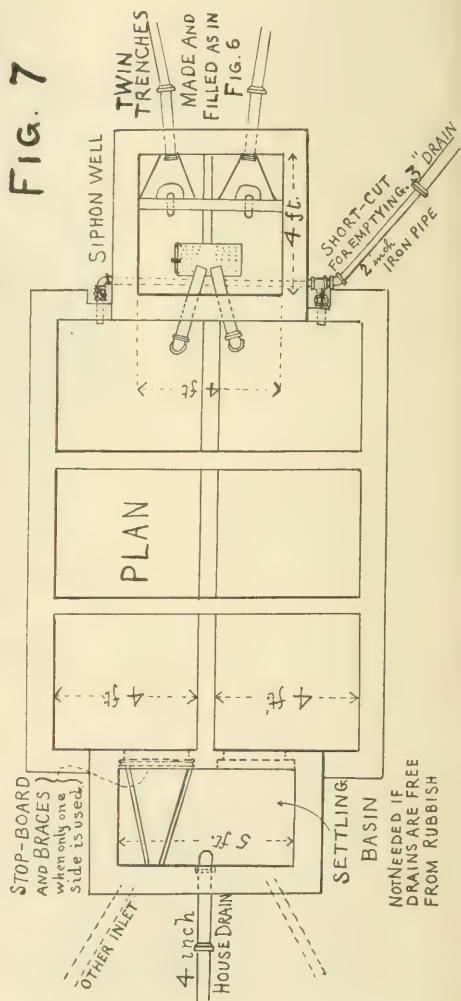
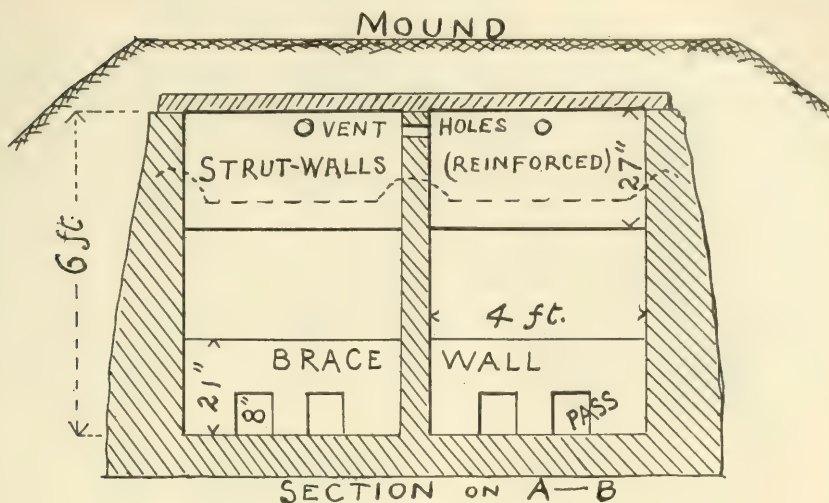
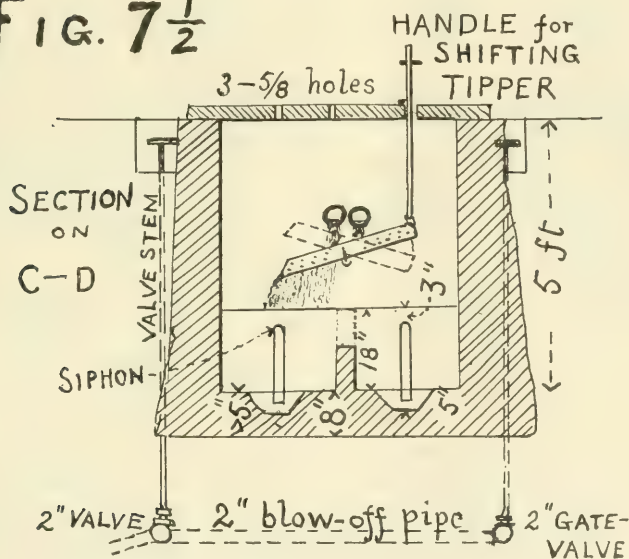


FIG. 7





FIG. 7 $\frac{1}{2}$ 

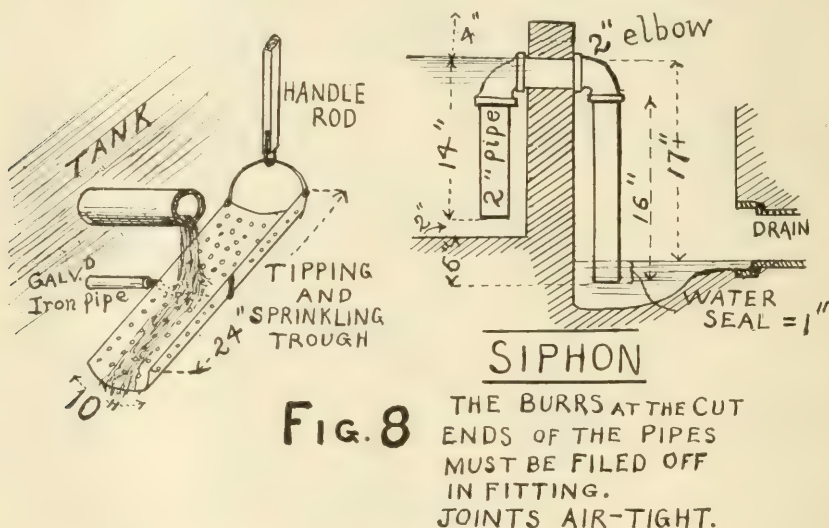
is to have the construction and operation as simple as possible, with the least amount of "machinery"; nothing being prescribed but what is usually at hand and not difficult or expensive to obtain, and with the expectation that it will operate with only a little care and attention.

*In the operation of the Tank* if sludge accumulates unduly and too rapidly, there are probably faulty conditions. There may not be depth enough to allow the process of "digestion" to proceed properly; the inflow may be too dilute or irregular, as by admitting rain water, or other excessive flow; or the movement through may be so slow as to be almost stagnation, if the tank be too large for its duty. Observation and trial will show what correction is needed.



## DESCRIPTION OF PRINCIPAL DETAILS.

*The Outlet.* As the sketches show, the effluent passes from the tank through a 3-inch glazed pipe having a quarter bend attached to its inner end. This is set tightly in the end wall at the mid-width, tipping slightly forward. Six inches below this a piece of  $\frac{3}{4}$ -inch pipe about a foot long is set as a socket to carry a hinge rod to which is attached a tipper trough made of galvanized iron 12 x 24 inches. Except for space about eight inches square at the middle, where it is attached to the rod, this trough is perforated by 1-8 inch holes. A divide wall separates the space below into two equal siphon basins. By a handle passing through the cover, the trough may be inclined either way so as to direct the stream into either basin. When the basin is full, it is emptied by the siphon and the contents delivered to the 3-inch drain pipe which distributes them through the material of the trench as described below. The outlet basin should be narrowed towards the drain pipe, as in Figs. 6 and 7, so that the water will rise for a time higher than the bell of the pipe. The



success of the method depends much upon this distribution which should be as far-reaching as possible, and which requires the effective flushing at intervals, with rests between, which the siphon accomplishes. The details of these parts appear in the sketches. As to holes in the covers, as indicated, one  $\frac{3}{4}$ -inch hole should suffice; but the bent vent-pipe shown by the sketch is much to be preferred.

*The Trenches.* Particular attention must be given to preparing the trench. Three and a half feet will probably be a suitable width, and the depth will depend upon that of the outlet of the siphon well. This outlet pipe or distributor is to be laid so as to spread its contents, lengthwise and sidewise over a filling of gravel beneath. Begin about one foot in front of the outlet well, and, in the next five feet, drop the bottom to a depth of 2 feet 6 inches below the outlet. The bottom of the trench must be carefully graded, usually on a slope of twenty-five inches fall in 100 feet. To do this, procure a ten-foot straight edge, and make one end two and a half inches higher than the other by fastening a wedge or block thereto; with a common level

# SMALL TANK AND TRENCHES, WITHOUT SIPHON, GROUND NEARLY LEVEL

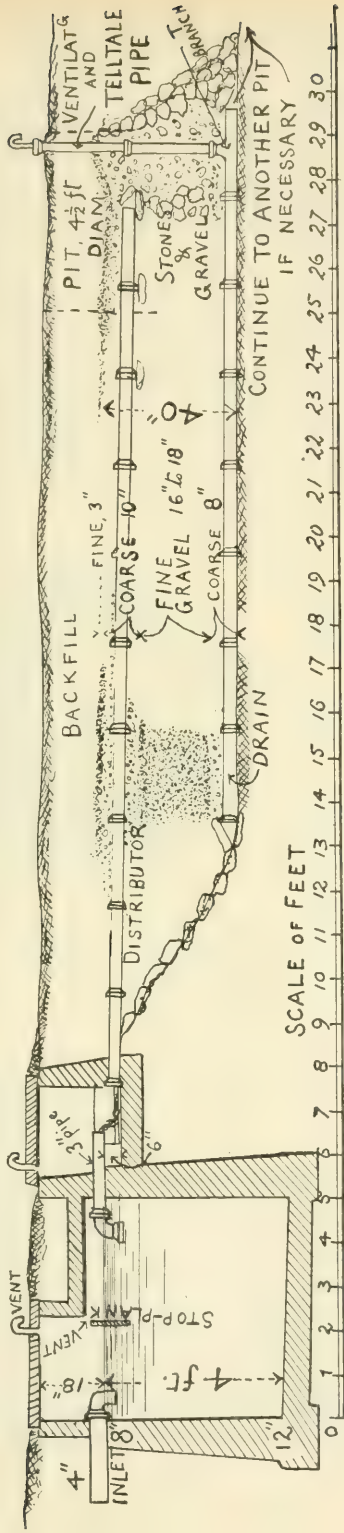
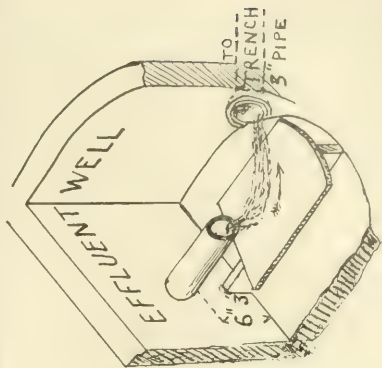
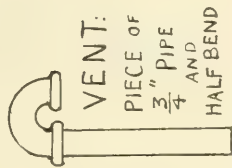
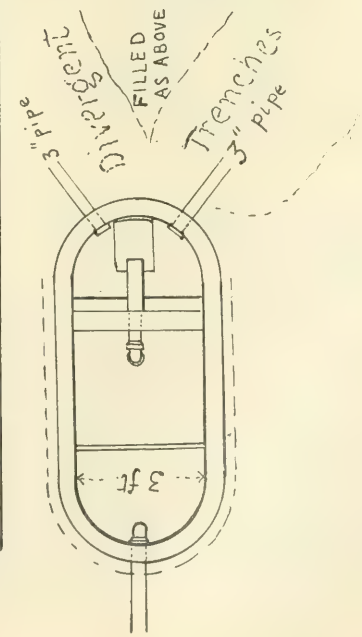
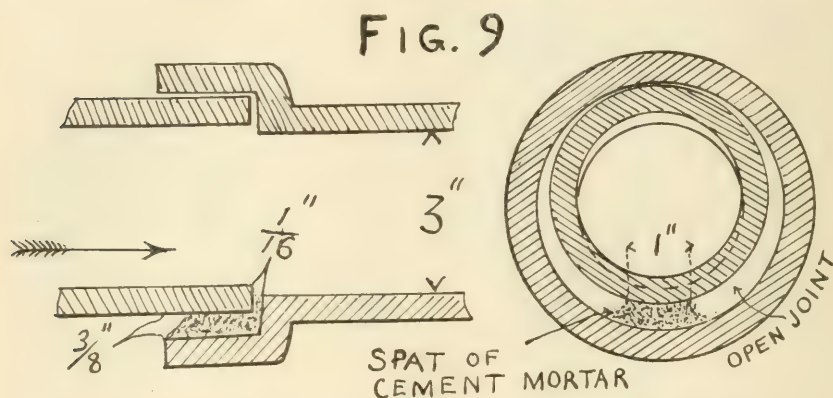


FIG 8 1/2



on top, this slope board will give grade. The trench bottom must then drop according to the grade given by the slope-board. In this bottom, which should dish toward the middle, lay 3-inch glazed drain pipe. Depressions must be made for the bells so that the pipe will rest its entire length on the graded bottom. Use a little cement in the bottom of each joint to "center" the pipes to an even grade. *The greater part around the joint must be left open and the pieces separated a little so as not to have a snug fit.* See Fig. 9, but note that the lower pipe must have even joints.

The gravel, or whatever serves as such, next claims attention. Firstly, all fine sand or dirt must be removed from it. Then two grades must be prepared by screening or otherwise; of the first the particles should be from the size of apple seeds or coarse sand up to the size of peas; the second grade may be called pebbles, being from the size of peas up to that of eggs, with nothing of more than  $1\frac{1}{2}$  inches in diameter. If nothing better is available, good clinkers or cinders might be prepared so as to furnish the needed sizes; also broken brick, broken clay pipes, crockery, etc., which have plenty of surface on the pieces. *As the gravel is placed in the trench,*



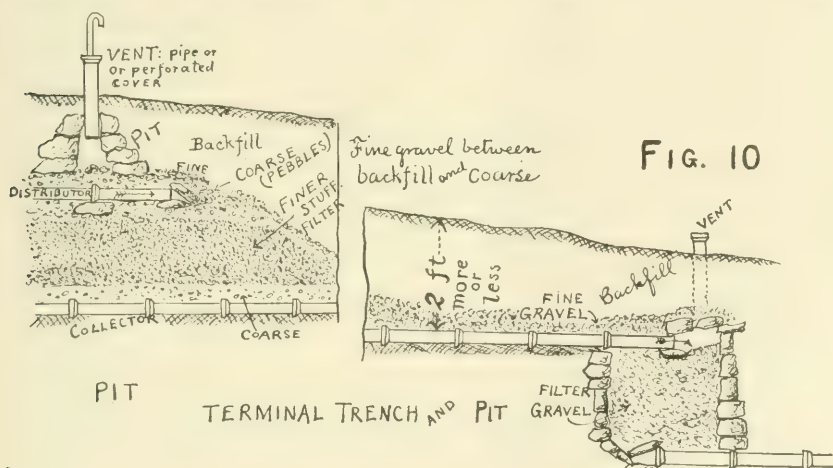
## STEPPED JOINT FOR DISTRIBUTOR PIPE (For Collector Pipe, Laid Even)

*some lining should be put on the bottom and sides to prevent the earth from creeping in and clogging the filling.* This lining may be flat field-stone laid on edge, old brick, or larger stones rejected from the gravel, placed by hand as the filling proceeds.

Beside and above the drain pipe, place the coarse stuff or pebbles at least 6 inches thick. Above this, fill the trench about 18 inches deep with the finer stuff, making the middle 4 inches higher than the sides. On this place flat stones at 2-foot intervals to support the distributing pipe, and then even up the trench with the pebbles. All this material *must be compacted enough* so that it will not settle. The stones must be set so that the upper pipe line when resting on them will be on the same grade as that below, and about 2 feet 6 inches higher. After the pipe is on graded line with the lengths separated about 1-16-inch at each joint, lift each spigot end in the bell until it strikes the bell at the highest point, and fix it there by a spat of cement mortar about an inch wide pressed in beneath the spigot end at lowest point of the bell. The remainder of the joint is left open as shown by Fig. 9. Then fill around the pipe compactly with a layer of coarse stuff (pebbles), about 6 inches thick;

above this and against the sides of the trench about four inches depth of the finer stuff. Above this, back-fill the trench and thoroughly tamp the earth and heap it over the trench so as to exclude rain water and hinder the clogging of the gravel.

*Termination.* This arrangement of the distributing pipe is intended to carry the first part of the flush wave out toward the ends of the trenches and to allow the latter part of the flush to trickle down through the open joints near the upper end. The body of fine material is intended to serve as a filter and the lower pipe to collect and carry away the effluent. Evidently the length of trench must depend upon the grade and the amount and rate of delivery from the siphon basin. Probably the basin shown in the sketches is too small for the largest tank. A length of 20 feet of trench may suffice for the smaller services and one of 60 feet or more for the larger services. At these limits an enlargement may be made in shape of a pit  $4\frac{1}{2}$  to 5 feet in diameter. This should be lined with any convenient stone and filled with small stones and pebbles, having above it a ventilating pipe, as shown in the sketch. The back filling over this must be first a layer of fine stuff and then earth packed hard and heaped up. The distributing pipe may terminate in this pit. The lower drain pipes



may be divided and continued at the bottom of two or three short trenches diverging from the pit and filled with stone tapered down to about 8 inches deep above the pipe. The pipes may terminate in small stone piles in shallow pits just below the natural surface of the ground. The number and length of the diverging trenches must depend upon the amount of effluent to be distributed. The arrangement is shown in Fig. 10, and diverging trenches indicated in Figs. 5, 7 and  $8\frac{1}{2}$ . If the liquid flows through and away too freely a portion of the trench near the end may be rearranged by putting in a larger body of the finer gravel.

Be it again noted that these are general suggestions and directions for adapting certain means to the end of inoffensive sewage disposal. They may and probably will require changes in dimensions and variations in arrangement to suit particular cases. When there is any doubt, further advice and information should be sought.

If this method is applied to very porous ground (which is not supposed in what precedes) great care must be taken not to allow the liquid to go beyond observation or control until there is assurance that it is inoffensive. In gravelly soil, the filtering



material is already present to an unlimited extent, but it must usually be assorted and placed so as to make a proper filter bed. If it is needful to purify the effluent within a short distance of the tank, a competent engineer should be consulted to prescribe the proper treatment. But the general principle may here be stated that the tank effluent should be *confined* to two or more radiating trenches used alternately. In these, the depth of filtering sand and fine gravel must be four or five feet, with distributor pipes and collecting drain arranged as before. But the effluent should be delivered where its condition may be observed. If inoffensive, it may be disposed of in any convenient way. Necessarily the trenches must have such lining as will surely confine the liquid and compel it to filter downward through the four or five feet of the filter body; and then such trench must have a suitable period of rest and aëration.

A simplified form of the smallest family tank is shown by Fig. 8½, drawn to indicate adaptation to nearly level ground. Here the siphon basins are omitted and a shallow efflux chamber about two feet deep is placed so that the flow may be alternately diverted into either of the two trenches. The accompanying sketch shows the very simple arrangement, to wit: The outlet pipe from the tank being about six inches above the bottom of the basin, the latter is divided by a narrow partition, 3 to 4 inches high; over this a properly shaped board or piece of roofing slate is tiled so as to throw the tank effluent from one side to the other as often as desired. The smaller and shallower effluent well permits less depth of trenches beyond, which is desirable in level ground, but this result could be gained for the deeper siphon well by raising the tank and putting a mound of earth over the top, provided the level of the inlet pipe would allow.

But the omission of the siphon basis is not advised. The additional cost is small; the siphon is a simple bent pipe, practically certain in action, *if* care is taken to have it set tightly in the wall *and the joints at the bends air-tight*; and the great advantage of a flushing discharge is gained. The variable trickle and occasional spurts from house drains tend to soak the near part of the trench chiefly, while the farther parts are seldom reached.

The case alluded to, where small tanks, or cesspools with stop-boards, were simply connected with agricultural drains—also a case in the writer's experience to be described further on—may suggest to some readers that the labor and expense for special materials put into the drainage trenches just considered are more than necessary; that a simpler style of trench would be sufficient. But in those cases there were favorable conditions and, at best, such expedients are liable to have only temporary value. When one is doing a work of this kind it is the part of wisdom to be thorough; to take no chances, but to have a care to make the conditions *entirely right*. The procedure which is recommended is based upon well-tried principles and practice, making possible the free movement and further alteration of the liquid beyond the tank.

For those situations where neither gravel, broken stone nor coal clinkers are to be had at low cost, other materials must be sought. In a brick-making region plenty of brick fragments may be available; in rare cases on the seaboard broken oyster and clam shells may be most convenient. Fragments of pottery, old tile pipe, etc., are good. In a region where stones abound a proper selection and disposition of suitable sizes in the trench may serve well, the smaller grades being obtained possibly by breaking. Where clay abounds, and nothing else is at hand, it may be properly burned in lumps so as to produce a clinker or "burnt ballast," such as is used in England; and this is very suitable. Coke would be excellent, but usually too expensive unless used only as the thin layer directly under the distributor pipes. What is



wanted in the trenches is plenty of void spaces (suitable gravel gives 35% to 40%) and the greatest possible *surface* on the pieces, on which the liquid may be diffused. The trouble with the so-called "blind drain," made by filling a ditch with large and small stones indiscriminately, is that it is only effective when new. The voids are filled after a while by soil washed in from above and from the sides; moreover the void spaces between and useful surface of the stones is much less than with smaller and assorted materials. A trench intelligently and carefully prepared according to the principles set forth herein should have certainty of action and should not become clogged.

### A CONTROLLED CESSPOOL.

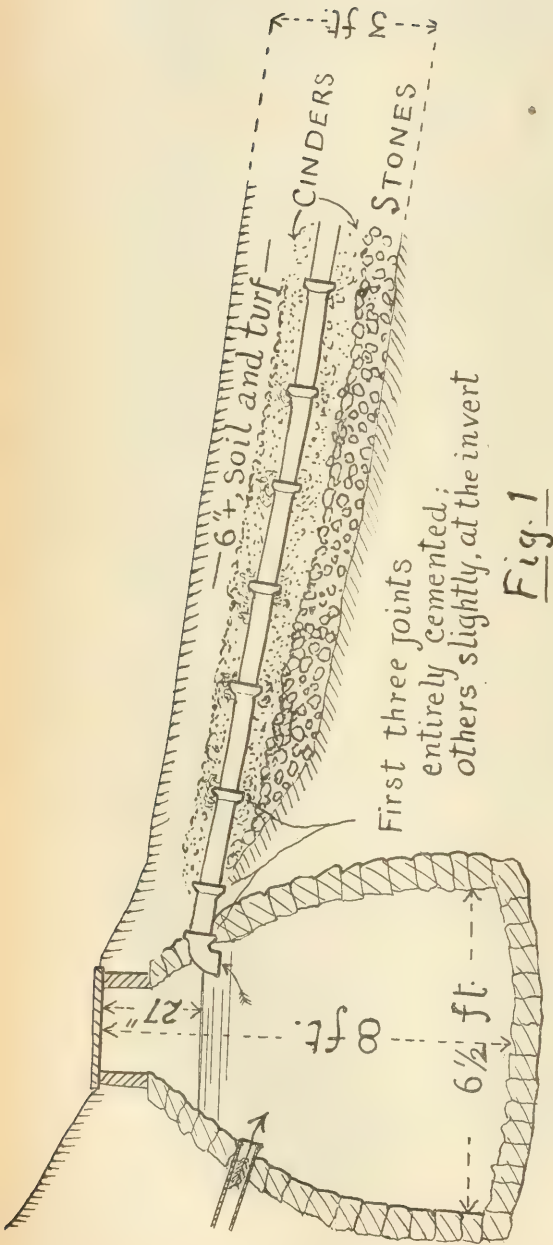
There are thousands and perhaps hundreds of thousands of householders who are committed to the cesspool and who think it unavoidable, as they must care for their wastes on a narrow area. Have they any remedy? A case in the experience of the writer\* was treated somewhat after the method just described. The house was in the suburbs of a small city of one of the Middle States, on a rather steep slope, and located about fifty feet back from and fifteen feet higher than the highway, below which are other houses in tiers on a still sharper slope, descending about three hundred vertical feet to a large body of water. As the house was fitted with the usual fixtures of approved sanitary plumbing, a cesspool was provided to receive the sewage from the household, the personnel of which varied from two to six or seven. The resources of the surrounding community are not equal to providing an adequate system of sewerage, while the conditions described demand special care from the higher residents against making any nuisance for those lower down. Fortunately the soil is a slightly permeable *clay hardpan*.

According to the usual practice of this locality, the cesspool is located in front of the house, just at the foot of the piazza terrace, so that the top is nearly on a level with the cellar floor within. In construction it is jug-shaped, as shown in the sketch (Fig. 1); paved and lined with stone, laid dry; the dome-like top terminating in a throat or manhole built up with brick and mortar; and tightly covered by a slab of Hudson River bluestone, even with the turf of the lawn. *No rain water was admitted.*

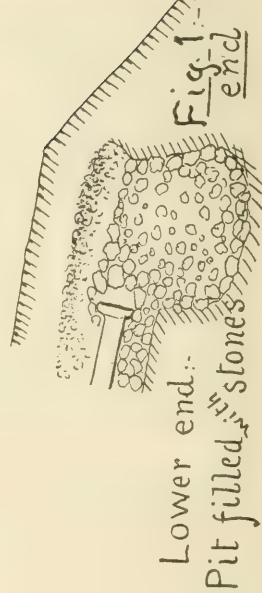
A visiting relative declared that the conditions which he found, after this cistern had been in use about twenty-one months, constituted a flagrant sanitary misdemeanor. It was full; and exuding from beneath the cover was a black or dark green, slimy deposit, which spread a yard or two through the grass which only partly concealed it,—always offensive to the sight and often to the smell. The owner met the remonstrances with the usual question and answer: "What can I do about it? We don't know any better way."

Obviously it was a case of choked cesspool needing relief; accordingly the usual appliances and help were procured from the city with the expectation that a large body of liquid must be *pumped* out and then a deposit of sludge *dug* out. But, as the pumping proceeded, the operators were surprised to find that the contents were all liquid,—light, yellowish brown in color and not overpoweringly offensive to smell. There was not a shovelful of deposit or sludge left in the bottom, although a few blackish flakes or flocculent matter came out through the pump. The bottom and sides of the cistern were at once sprinkled with about half a bushel of powdered air-slaked lime, and the writer descended into it immediately with not so much sense of offense as is experienced around the Moon Island plant of the Boston main drainage works.

\*Abstract of a paper in *New Hampshire Sanitary Bulletin* for October, 1908: "An Unhampered Cesspool."



## CESS-POOL AND OUTLET



Highway ditch

Here a process of nature had been proceeding, as it always has proceeded under like conditions, and always must proceed. But the operation had been hindered, and it was evident that the cesspool needed an outlet. Hence a hole was made through the stonework about two feet below the cover, and a combination of old-fashioned "blind drain" and pipe drain provided, as shown in the accompanying sketch. A trench was dug radiating from the cesspool outward and downward, about three feet deep, and filled about ten inches in depth with small cobblestones which could be had for the hauling. Above this was laid about three inches of coarse cinders from the railroad yard in the city. On this was laid a line of 4-inch glazed pipe,—the joints through the cistern wall and the first three joints outside being wholly cemented, and the inverts slightly for several lengths more. Around the pipe lengths some of the coarser cinders were placed, and the finer cinders at the sides of the trench and above the coarse stuff, until the cinder covering was six inches or more thick above the pipe. The fine cinders were intended to *hinder the clogging of the drain* by infiltration of the soil above and at the sides. Enough original soil was then well tamped in to fill the trench, and the sod carefully replaced, so that in a few days the surface of the lawn appeared as usual. It is almost needless to explain that this arrangement of material was for the purpose of extending the region of percolation and filtration. The trench was about 40 feet long, and the diameter of pipe in the lower half was reduced to three inches. The terminal pit shown in the lower sketch of Fig. 1 was an adaptation to the situation and intended to facilitate the filtration of the liquid to the surface of the lower terrace.

During more than three years of subsequent use there has been no offense from the cesspool, the very existence of which would not be suspected if not for the stone cover, and the only indications of the existence of the pipe outlet and porous drain, are the thicker growth of grass at the lower edge of the lawn and a luxuriant growth on the terrace slope near the pit; also, in the roadside ditch, a perceptible but inconspicuous seepage which is so far purified as not to betray its origin to the sense of smell,—even to a person working close to the ground with a grass sickle.

Let it be noted that it was practically a tight cesspool (soil not absorbent), and the only soil pollution was from the overflow on the surface. There was *stagnation*, but Nature had transformed all of the solids into liquid and gas. The rather crude porous trench provided was intended to give the partly purified effluent freedom to move along slowly and under conditions wherein Nature is known to remove offense (partly or wholly) from foul liquid. The discharges were put out of sight and at the same time not altogether beyond observation and control. As it was, there was not sufficient means of aëration of the drainage provided. The more effective arrangement as previously described might have been used on a reduced scale.

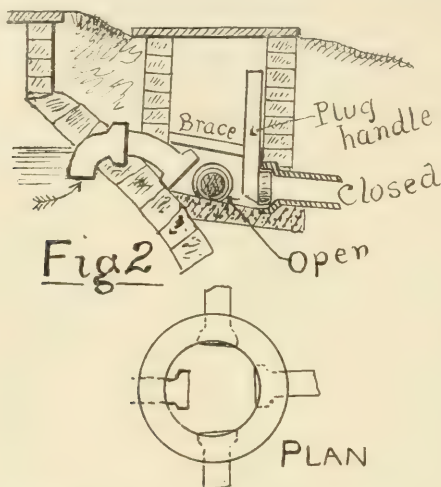
In gravelly or otherwise porous ground, the flow from the tight (cemented) cesspool must be managed so as not to do mischief by percolating too rapidly. The materials in the trenches must be disposed so as to secure slow filtration, and pipe collectors must be placed at the bottom so that the state of the final effluent may be observed. The proper treatment has already been indicated.

As to other conditions: The grade of the trenches should be made slight, preferably not more than  $2\frac{1}{2}$  inches fall in each ten feet, so that the drainage may not be too rapid. Evidently a soil saturated with ground water offers an impossible situation. If the householder is hampered by a narrow lot and small area, the advantage of two or more radiating trenches used alternately is obvious.

A small chamber made of concrete or cemented brick-work may be built just outside the curb or throat of the cesspool, so that the effluent may be successively diverted into one of the two or three pipe drains, the others being stopped by a

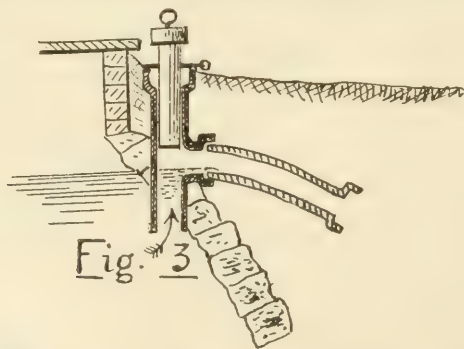
wooden plug (or valve). (See accompanying sketch for details.) The plugs each have a 2 inch by 2 inch wooden handle and may be stayed in place by a properly fitted board or disc formed into the segment of a circle. When a drain needs rest, it may be closed by a plug taken from one of the others opened for service. Such a chamber would slightly promote initial aëration.

Or it may be more convenient and less expensive to insert through the masonry



of the cistern, around the throat, two or more T branches of ordinary glazed pipe, the branch serving for outlet into the drain. To close the unused drain or drains, have a wooden stopper loosely fitting the main stem of the pipe, and let down so as to cover the outlet. The detail of this is shown in Fig. 3.

If the question is raised as to the freezing of such drains in Northern localities, we may admit that frost may encroach upon them in the periods of inaction through



long winter nights, especially if the ground is not protected by snow or leaves during weeks of severe cold. A thick turf over the trenches is a favorable condition, and, if the drains do not clog, experience proves that it is a rare case where a drain two or three feet deep, carrying domestic sewage—which has a normal temperature of 50° F. or more—actually freezes to the point of stoppage, *unless the outlet is allowed to freeze*. It is easy to put a slight covering of leaves and brush at points of exposure.



## SIMPLER CONTRIVANCES ADAPTED TO SPECIAL SITUATIONS.

The bulletin of the California State Board of Health for March, 1910, gives a design for a tank which is a plain square box made of concrete, buried in the earth, covered by plank and earth, having a small vent-pipe through the cover. A stop plank extends across the bottom near the inlet, and a baffle across the top near the outlet. The effluent passes into a system of buried pipes arranged for subsurface irrigation. For a climate and location where all water is generally needed the plan is well adapted, but the plank cover should be replaced by more durable material.

The Public Health and Marine Hospital Service of the United States, in reprint No. 54 from the Public Health Reports, describes an arrangement which consists of a seat placed over an old kerosene oil barrel two thirds full of water. A pipe with a T branch through one side at water level delivers the effluent into a smaller barrel or tub. Both the top and lower ends of the T pipe in the "liquifier" are screened, and both water surfaces are covered with a film of oil to guard against mosquitoes. Under intelligent care, and attention to the emptying of the effluent tank as required, this might work well. The apparatus is inexpensive, may be placed in any suitable outhouse; it is nearly free from odor and the fermentive changes gradually liquefy the contents. An "automatic closing" lid to the seat and cover over the effluent tank exclude flies. An "anti-splasher" is placed in the main tank.

A New Zealand contrivance comprising a special form of closet-pan holding four gallons, emptied once or twice a day into a pipe leading to a "mascerating pit," 8 feet long by 4 feet by 4 feet, lined with a plaster of concrete or tar, is described in *Engineering News*, Vol. 58, page 467.

These "inexpensive" devices are only mentioned because of possible adaptation to a summer camp. They should not be used about a residence for permanent fixtures; for they will almost certainly require considerable care and attention and with repairs may prove costly in the long run.

## DRY DISPOSAL.

Where there is no water-supply sufficient to operate water-closets, some form of dry earth treatment is usually the simplest and least expensive. Tested by experience, the following form of this may be termed

*The Endurable Privy.*—When properly used by the household this realizes a literal conformity to the sanitary regulation of Moses in Deut. 23: 12, 13.

Prepare the vault by paving the bottom with small stones, dishing to the middle or one corner whence a cheap drain pipe, *laid with cemented joints*, will conduct the fluids to a suitable point underground or to the garden (porous soil near trees). The effluent from this is usually quite small, but it serves for an occasional washing out. Cover the paving with a layer of Portland cement mortar, about half an inch thick. Any man of practical sense can use a shovel and trowel and a few pounds of sand and cement, with skill enough to build such an arrangement in a few hours. (See Fig. 11.) Build a box of 1½ to 2-inch plank, of proper size, say 20 to 24 inches wide and deep, and as long as desired; bore in the bottom and sides plenty of ¾-inch holes; mount this on board ways, slightly inclined towards the vault door; rest the box upon rollers (old pipe or broomsticks), so that it will readily roll when gently pulled. Provide a box of sifted *coal* ashes or earth, quite dry, and scatter about one quart over each dejection. With only ordinary use the liquid will be largely absorbed,—



and the odors will be prevented or greatly mitigated; but even with some abuse, and only fairly frequent use of the dust, the closet will be comparatively inoffensive and there will be no soil contamination. By actual experience such a box made of hemlock plank was serviceable after a dozen years or more. The labor of removing and emptying such a box is not difficult or very disagreeable. A few rollers, two or three lengths of boards or planks, a pit dug in a proper place and a little patience in the shoveling will suffice for the task. One man can handle such a box, adapted to a family of four or five people, and requiring to be emptied two or three times a year. To insure the certain use of the dust a box cover, like that shown in Fig. 12 may be provided. The dust must be rather fine and *dry*. Of course the simplest provision for the closet is a box of dust with an old quart dish for a sprinkler.

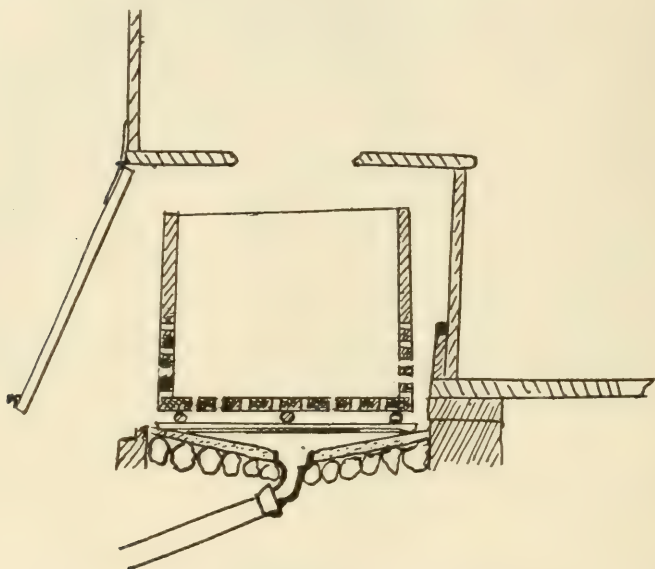


FIG. 11—Details of construction of vault and box for earth-closet.

An upstairs closet if located near a chimney or partition may have the hopper or cone under the seat terminate in a vertical line of 10-inch glazed earthenware pipe set over a water-tight brick vault kept tightly closed. If the dust is freely used, the contents of such vault will appear only damp or slightly moist and will give no offense. This supposes that kitchen slops are excluded and ordinary care given to it. The writer formerly used both arrangements many years with success. Before the general introduction of water-works, the dry-earth system was widely used, especially in England, where it was invented by the Rev. Henry Moule who made a study of the absorbent disinfecting properties of dry earth or dust. It is just as worthy today of extensive use under the conditions to which it is adapted. It has been successfully used more than 40 years in army barracks, where the vault boxes were made long and shallow, and so placed as to be dragged out by horses for emptying as required.

Such a system is especially adapted to summer cottages, camps, larger encampments and small hotels or lodging houses, where water fixtures are too costly or inexpedient because of the transient use of the premises; also under conditions where water-pipes cannot be protected from freezing. By a little forethought *dry earth* (not clear sand) can always be collected and stored under cover, to be distributed to closets as needed. The system may be and has been specified for steamboats required to avoid pollution of the waters navigated.

N. B.—THE FUNDAMENTAL CONDITION OF SUCCESS in operating this or any other system herein described is CONSTANT ATTENTION and CARETAKING. Thus far we have considered the simplest devices, both on the score of expense and because ordinary people balk at anything that looks like *machinery* or a *contrivance*, especially if it requires a little extra care or thought. The evil conditions we have considered are due chiefly to neglect. No system will run itself; human agency must constantly intervene, else *neglect* will spell FAILURE. The ordinary latrine of the camp soon becomes an abomination if not covered daily; and human beings who, in the woods, conduct

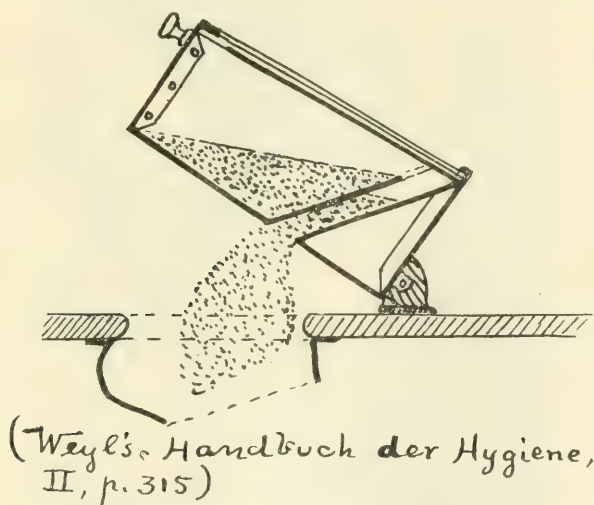


FIG. 12.—Self acting dust closet. The lid is replaced by a hinged reservoir containing the dust. Whenever this is let down a certain quantity of dust is discharged automatically and thrown upon the night soil.

themselves after the careless and unblushing habits of the dog, rather than adopt the more cleanly ways of the cat, should not boast of the civilization of the twentieth century.

*The Dry-Earth Closet*, as technically known, requires the apparatus already alluded to, and the *system* is so important and useful as to merit more description.\* The dry conservancy system is extensively in use today even in certain large cities on the continent of Europe, where sewers have not yet been introduced. This consists in the main of the frequent removal of excreta, in the country by some man servant or member of the family; in villages and towns according to some coöperative plan, as before stated.

\*Some of the following pages are adapted or quoted from Bulletin No. 43, United States Department of Agriculture, "Sewage Disposal on the Farm," prepared by Prof. Theobald Smith, M. D., Harvard University.

The earth to be used should be a rather fine loam, sifted to remove coarse particles, thoroughly dried by spreading out in the sun or under a shed, and then stored in barrels. The drier the earth the better it is. The finer the particles of earth, the greater the capacity for absorbing fluids. It is for this reason that sand is not satisfactory. Coal ashes are quite suitable, as they are, after proper sifting, of the requisite fineness and are thoroughly dry. The mixture of earth or ashes and night soil should be removed at certain times, depending on the location of the closet, the season of the year, and other conditions.

In cold climates, indoor closets are especially desirable to obviate the exposure which cannot be avoided when closets are out of doors. For invalids there should be a carefully managed earth-closet kept in a well-aired room set apart for this purpose. In warm climates, earth-closets should be frequently cleaned. To prevent

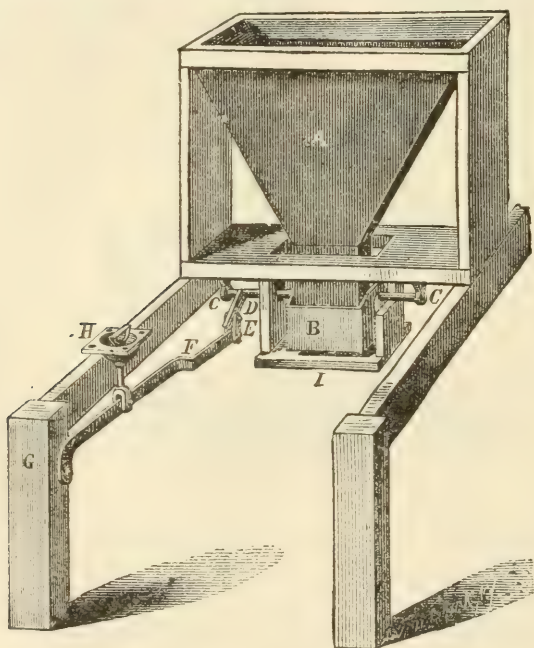


FIG. 13.—The old form of earth closet with frame and pail removed to show the mechanism. The handle on the left when raised throws into the pail a certain quantity of dry earth or ashes from the reservoir or hopper in the rear.

the attraction of flies and insects and the too rapid decomposition of the contents, a little unslacked lime added with the earth to the excrement will be of value. The discharges of persons suffering from typhoid fever and bowel troubles should be mixed with thin slaked lime\* (milk of lime). One half to one hour after the mixing, such discharges may be put upon the soil, always at some distance from a well or spring, a stream, or a field under cultivation.

In Europe the use of earth and ashes has been superseded by peat dust. The upper layer of peat is dried in the air and ground in a suitable machine. The coarser

\*Lime, to be used for disinfection, should not be air-slaked, but kept in tightly-covered receptacles to prevent this from taking place.

particles are removed by sifting and used for bedding in stables. The fine portion which has a very high absorbing power for fluids and is also capable of preventing odors, is used in dry closets. In Germany there are at present (1896) about 30 factories engaged in the preparation of peat moss for the purposes mentioned. Its great advantages over dry earth should bring it into use in our country.

We may profitably quote the conclusions of the late Colonel Waring, sanitary engineer, on the value of the dry-earth system:

"Precisely what the earth-closet and its accessories, as now contrived, accomplish is the following:

"1. A comfortable closet on any floor of the house, supplied with earth, and cleansed of its deposits without the intervention or knowledge of any member of the household.

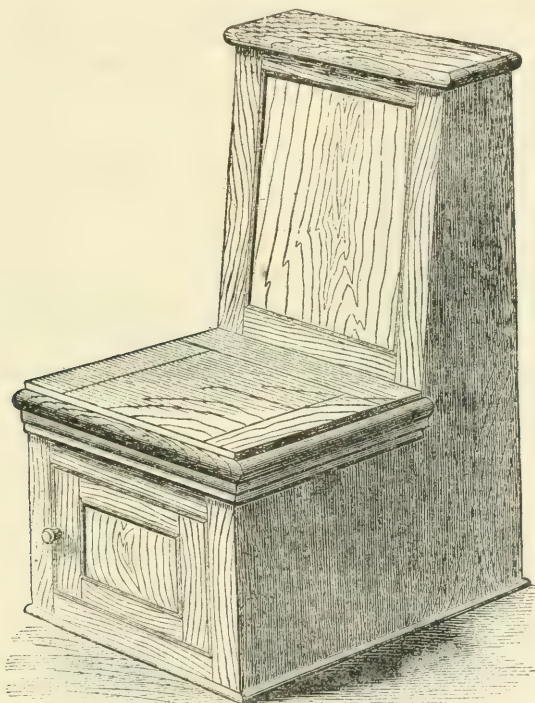


FIG. 14.—Appearance of Fig. 13 with casing in place.

"2. A portable commode in any dressing-room, bedroom or closet, the care of which is no more disagreeable than is that of an anthracite stove.

"3. Appliances for the use of immovable invalids which entirely remove the distressing accompaniments of their care.

"4. The complete and effectual removal of all the liquid wastes of sleeping-rooms and kitchen.

"5. The removal of the most fertile source of typhoid fever and dysentery, and the prevention of cholera infection.

"6. The complete suppression of the odors which, despite the comfort and elegance of modern living, still hang about our cesspools and privy vaults, and attend the removal of their contents."



## KITCHEN AND CHAMBER SLOPS.

The removal of kitchen and chamber slops is a matter which also requires proper attention, as this liquid frequently gives rise to unhealthful conditions, annoying alike to sight and smell when carelessly disposed of. The simplest way to utilize kitchen slops is to pour them upon plants about the house in summer, in winter upon the soil, each time in another spot, so as not to supersaturate the surface layers of soil in any one place. A means of less trouble, recommended by Waring, is to partly fill with soil a barrel with a leaky bottom and cover this with a layer of stable manure to prevent the puddling of the soil. The slops filter through the soil and leave the barrel below as a clear fluid. The barrel is emptied two or three times a year and the contents used for fertilizer.

Subsurface irrigation has been extensively practised and is successful under favorable conditions. The trenches already described, if made shallower and smaller, and placed not too near growing plants would serve well where the ground is suitable. But any systematic arrangement of that sort requires competent supervision of the construction.

House slops may be disposed of by surface irrigation or by subsoil pipes (agricultural title). The originator of this method, Mr. Moule, may here be profitably quoted as to its simplicity and success:

"Where there is a garden the house slops and sink water may, in most cases, be made of great value and removed from the house without the least annoyance. The only requirement is that there shall be a gradual incline from the house to the garden. Let all the slops fall into a trapped sink, the drain from which to the garden shall be of glazed socket pipes, well jointed, and emptying itself into a small tank, 18 inches deep, about a foot wide, and of such length as may be necessary. The surplus rain water from the roof may also enter this. Out of this tank lay 3-inch common drain pipes, 8 feet apart and 12 inches below the surface. Lay mortar at the top and bottom of the joints, leaving the sides open. If these pipes are extended to a considerable length, small tanks, about 1 foot square and 18 inches deep, must be sunk at about every 20 or 40 feet to allow for subsidence. These can be emptied as often as required, and the deposit may be either mixed with dry earth or be dug in at once as manure. The liquid oozes into the cultivated soil, and the result is something fabulous. . . .

"On a wall 55 feet in length, and 16 feet high, a vine grows. A 3-inch pipe runs parallel with this at a distance of 6 feet from it for the entire length. The slops flow through this pipe as above described. On this vine year after year had been grown 400 well-ripened bunches of grapes, some of the bunches weighing three fourths of a pound. During a period of four years, for a certain purpose, the supply was cut off. To the surprise of the gardener scarcely any grapes during those years appeared; but after the supply was restored, and the consequence was an abundant crop, the wood grew fully 16 feet, of good size and well-ripened."

In place of an indoor sink, an upright tube or hopper may be constructed out of doors in communication with the subsurface pipes into which the waste fluids are poured.

## WASTE AND GARBAGE.

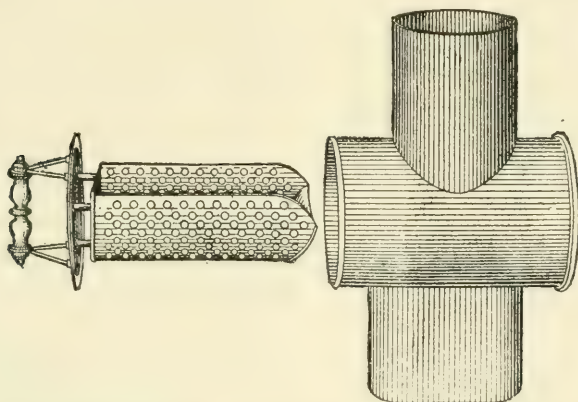
The attractiveness of a rural home depends largely upon the promptness with which all kinds of waste material are disposed of. The abundance of space around the house is a great temptation for the members of the household to use it as a place for storing rubbish and useless, worn-out things. Sifted ashes are easily utilized in



earth-closets and upon walks and roads, to make them compact and firm. Other articles of no use, such as broken crockery, bottles, tin cans, etc., can be thrown into depressions and gullies and covered over with earth, or else buried in trenches where subsoil drainage is desirable. The removal of rubbish is a very fruitful theme and might be dealt with at length. Its importance, as related to health and disease, is a subordinate one, and the reformer must appeal to the love of order, propriety, and beauty in and around the home in order to make an impression.

[Of late years, we have learned that this is not a secondary matter. The decaying remains in tin cans attract flies; the pools of water which they may hold are breeding places for mosquitoes; and these insects are active carriers of diseases.—ED.]

Garbage is of much less annoyance in the country than in the city, where its collection and destruction is a great expense, and is frequently very unsatisfactorily done. In the country, the household garbage is fed to the swine and poultry, and is in this way profitably used. There are, however, homes where garbage must be taken care of in other ways. It may be buried in the garden or else burned in the kitchen range. Recently a device has been patented which enables the house-



Garbage cremator. The garbage is placed in the perforated frame. The latter is pushed into the smoke pipe, where the garbage becomes slowly carbonized.

keeper to place the garbage in a section of the smoke-pipe of the range, where it dries out rapidly, burns and leaves only a little charcoal behind, which may be used for fuel next day. This device has been well recommended by sanitarians.

### PROTECTION OF DRINKING WATER.

The next subject to claim our attention is the protection of the sources of drinking water. In the country, water is, as a rule, obtained from wells and springs. The important bearing upon well water of soil purity demands a few explanatory remarks concerning the origin of well water. Wells are excavations made into the ground to a variable depth until water is reached. This water is denominated ground or subsoil water. Its origin may be better understood if, for the moment, we conceive the surface of the earth as more or less irregular and entirely impervious to water. The rain would collect on this surface and form lakes, ponds and streams, according to the configuration of the surface. If, now, we conceive this surface covered with sand or other porous earth to a greater or lesser height, and the top of

this be considered the earth's actual surface, the water will remain in the same position, but it will be buried within and fill the pores of the overlying soil as subterranean lakes, ponds and streams. In digging a well we remove this porous layer of earth until we reach these subterranean streams or reservoirs of ground water. It thus appears plain why ground water may flow as any surface stream and pick up on its way various substances which have percolated into the ground.

When the bed of soil, overlying the impervious layers, is very deep, wells will have to be dug down to a considerable depth to reach the surface of the ground water. Where this layer of pervious earth is of slight thickness, wells will be shallow, and the ground water may appear on the bottom of gullies, trenches and wherever the porous layer has been dug or washed away.

The movement of the ground water depends on the inclination of slope or the impervious strata, and has been observed to be quite rapid in some instances. By adding common salt to the water in a well its detection in other wells at a short distance has been found a guide in the determination of the rapidity and direction of the underground current.

When the ground water, resting on the uppermost impervious layers, is near the surface, and therefore not safe or fit to use as drinking water, it may be possible, by digging below this layer, to find another porous bed containing water. This source will, in general, be much purer, since it is less exposed to pollution from above, and since the water has to travel longer distances underground. Such a deep supply must, however, be protected from the superficial supply by a tube or watertight wall, extending to the surface of the deep supply, otherwise the water from the upper layers will simply drain into the well.

#### WAYS OF CONTAMINATION.

Wells are exposed to contamination in two ways. The surface water from rain, house slops and barnyard drainage may find its way into the well at or near the surface of the ground. Or the ground water stream supplying the well with water may, in its subterranean movements, encounter cesspools or seepings from cesspools, and carry with it soluble and suspended particles, some of which may enter the well. The danger of typhoid fever bacteria entering the water has already been mentioned. Since the actual condition of the deeper layers of the soil between cesspool and well cannot be known, it becomes imperative to prevent all pollution of the ground-water current supplying wells by either abolishing the cesspools or else placing them at a considerable distance from all sources of water.

Besides typhoid fever bacteria, those organisms which cause digestive disturbances and severer troubles, such as diarrhoea, dysentery and possibly other unknown diseases, may be carried into well water. During cholera epidemics, polluted wells might form centers of infection. Eggs of animal parasites may be washed in from the surface. Again, the barnyard manure, representing the mixed excrement of various animals, may, under certain conditions, be bearers of disease germs, and such excrement should, under no conditions, be looked upon as entirely harmless to human beings.\*

Besides the protection of the ground water near the well from pollution, emanating from cesspools, etc., the surface of the ground about the well should be kept free from manure, slops and other waste water; hence the well should not be dug under or close by the house,† nor should it be located in the barnyard, where the ground

\*It is probable that the filth which gets into cow's milk and which appears to be mainly excrement of cows is largely responsible for the severe summer diseases of infants fed on cow's milk.

†The water may be carried into the kitchen by running the pipe from the well, horizontally, under ground.

is usually saturated with manure. It should be surrounded by turf, and not by richly manured, cultivated or irrigated soil. The ground immediately around it should slope gently away from it and be paved if possible. The waste water from the well should not be allowed to soak into the ground, but should be collected in water-tight receptacles or else conducted at least twenty-five feet away in open or closed channels which are water-tight.

### CONSTRUCTION OF WELLS.

The well itself should be so constructed that impurities cannot get into it from above or from the sides. If water can soak into it after passing through a few feet of soil only, it cannot be regarded as secure from pollution. To prevent this, the well may be provided with a water-tight wall, built of hard-burned brick and cement, down to the water level. The outside surface of this wall should be covered with a thin layer of cement. Or tile may be used to line the well and the joints made water-tight with cement down to the water level. Driven wells, *i. e.*, wells constructed of iron tubing driven into the ground, are, perhaps, the safest where the quantity of water needed is not large and where other conditions are favorable.

These different devices are all designed to keep the water near surface of the soil from percolating into the well. To keep impurities from entering the well directly from the top, considerable care is necessary. Such impurities are likely to prove the most dangerous because there is no earth filter to hold them back and destroy them before they can reach the water. Adequate protection above may be provided in several ways. The sides of the tiled wells should project above the surface and be securely covered with a water-tight lid. The ordinary well should also have its sides project above the surface and a water-tight cover of heavy planks provided which should not be disturbed excepting for repairing or cleansing the well. Under no circumstances should objects be let down into the well to cool. A still better method of protecting the water from above is to have the lining wall of the well end three feet below the surface of the ground and to be topped there with a vaulted roof closed in the center with a removable iron or stone plate. This should be covered with earth and paving sloping away in all directions.

Too much care cannot be bestowed upon the household well. It should be guarded jealously and all means applied to put the water above any suspicion of being impure. This is especially true in dairies where well water is used in cleaning milk cans, and where steam and boiling water have not yet found their way for this end. Polluted wells in such houses not only endanger the health of the inmates but that of a more or less numerous body of city customers.

Prof. Theobald Smith closes the paper from which we have made the foregoing abstracts with the following two paragraphs:—

“The principles to be kept in the foreground are the disposal of sewage in the superficial layers of the soil in not too great quantity, the disinfection of the stools of the sick with lime before such disposition is made, the digging of wells in places kept permanently in grass and at some distance from barnyards and, above all, their thorough protection from contamination from the surface and from the soil immediately below the surface.

“In every community there are public-spirited citizens who could do much good by taking hold of the simplest and safest methods of disposing of sewage and refuse, putting them into practice, and showing the rest of the community just what good can be accomplished and what harm avoided by a little continuous attention to sanitary matters. In this way many may be led to undertake improve-



ments who, with no definite knowledge of the expense involved and with misgivings as to the final success of the undertaking, would otherwise hesitate to make a beginning."

## OTHER ASPECTS OF PRACTICAL SANITATION.

*Cost and size of pipe sewers* on the "Separate System," that is, for house service only. Concerning such work many people have exaggerated ideas, and a few facts are here stated to correct such misapprehension on the part of the general public:

1. *The cost of pipe sewers* for household waste only is surprisingly small, if there is only ordinary ditch work and a *competent foreman* supervises the work for the owners. [See paper on "Construction of Village Sewers," by the writer, Vol. 17, p. 214, Report State Board of Health.]

*Instances:*—In Hanover 1,519 feet of 8-inch pipe, 612 feet of 6-inch pipe and 226 feet of 5-inch house connections cost \$571, or 24½ cents per linear foot, complete; again, 806 feet of 8-inch pipe, and 653 feet of 6-inch pipe cost \$341, or 23¼ cents per foot. Again, a main line of 2,437 feet of 8-inch pipe and 969 feet of 10-inch pipe, with seven manholes, 5 to 11½ feet deep, cost \$1,289, or 38 cents per foot, all labor included. Within a few weeks a small sewer about 840 feet long was put in and connected with a manhole, in 25½ working hours at a cost of \$181, or about 21½ cents per foot, all told. This was for the college under direction of a student of the Thayer School of Civil Engineering.

2. *Surface water must be excluded*; only household wastes admitted. Hence *joints* must be made *water-tight* with cement mortar; else *tree roots* will enter and *choke* the pipes and the ground will be polluted.

3. *Small sizes of pipe* are ample. An 8-inch main will suffice for a large village. Such a pipe, sloping one foot in 100 feet for two miles, would serve 5,000 people, at 50 gallons each per day, and then run only half full. But *absolute uniformity of grade* is essential; the sewage must never slack up or stop in its flow. House connections should be 4-inch pipe or 5-inch; all trapped or covered by strainers to positively exclude garbage.

4. *Danger of freezing* very slight; temperature of sewage at the house seldom less than 50 degrees F.; in the coldest winter weather a large volume of sewage has repeatedly thawed down through two feet depth of frozen ground and disappeared. Nevertheless, ordinary outlets should have some protection or cover from the effects of cold winds or long-continued exposure. Hence, also, the drains, heretofore described for subsoil irrigation, if not in a naturally sheltered situation, should be protected by leaves or straw spread over the ground above.

5. *Flies and Garbage.* The sanitary condition of an entire neighborhood is much affected by the prevalence of flies. Everybody ought to realize that the swarms may be greatly diminished by removing and destroying, so far as possible, all material which attracts them, and in which they breed. Hence all waste vegetable matter (garbage) and refuse animal matter of every description should be promptly burned or *effectually* buried. Unfortunately such material is usually abundant about stables, and countless numbers emanate from them; but the unavoidable evil might be very much lessened by care to keep the stables cleaner and the material under cover as much as possible, since flies avoid darkness. A charring device for a stove-pipe has

been described already; but housekeepers could destroy small quantities without offensive odors by placing it along a narrow space only, on the front part of a fire in the stove or range, so that the evaporation of moisture and the charring may proceed slowly. In winter time the ledge just inside the door of a furnace is a convenient place for charring effectively considerable quantities of garbage.

#### LEGAL AND PERSONAL ASPECTS OF THE PROBLEM.

A considerable part, if not the majority, of the people in cities and towns enjoy the public utilities provided by municipal government or corporations,—water-supply and sanitary conveniences,—with little thought of the benefits received, and with little or no knowledge concerning their construction and operation. Hundreds abuse and injure them through ignorance or stupidity, and many others in sheer malice. We have seen how, in more rural districts, evil conditions are due to ignorance, laziness or selfish indifference to the need of improvement. In order to protect the well-informed and right-minded public from the part which is otherwise minded, the state has stepped in with salutary laws, and has given large authority to its board of health to compel correction of abuses and unsanitary conditions. It is sufficient to state here that these laws, and the regulations made in accordance with them, relate to:

1. The prevention and removal of all nuisances, upon proper complaint.
2. The protection of waters used for domestic purposes.
3. Adulterations and sale of unwholesome foods and poisons.
4. Inspection and sale of milk, butter and cheese.
6. Prevention of introduction of epidemic diseases into the state, quarantine, and the control of communicable diseases.

The general public is becoming yearly more enlightened as to the vital importance of right sanitary conditions. The fair fame of the state for the attractiveness and healthfulness of its summer resorts is more than ever dependent upon the *undoubted* are manifested to secure pure water, untainted air, milk and butter beyond suspicion, and surroundings which have “no *out* about them.” Neither farmers, managers of hotels or managers of encampments can long retain desirable patrons unless they study and *work* and *spend* money to have their places *clean* in all of these particulars. “A word to the wise is sufficient.” Intelligent action, based upon the preceding information and suggestions, will preclude that exercise of the authority of the state board or local boards of health which becomes imperative when the rights of the public to pure surroundings are infringed.



## APPENDIX.

## QUANTITIES OF MATERIALS FOR TANKS.

	Fig. 8 1-2 cu. yds.	Fig. 5 yds.	Fig. 6 yds.	Fig. 7 yds.
(a) Concrete not reinforced.....	3	6	10	24
(b) Concrete reinforced.....	2	4	7	16
(c) Rubble, cement mortar.....	4	8	14	32
(d) Brickwork, cement mortar.....	3	6	10	24
Gravel or broken stone for (a)....	2 1-2	5	8 3-8	20
Same for (b).....	1 2-3	3 1-3	5 1-2	13 1-2
Sand for (a).....	1 1-4	2 1-2	4 1 4	10
Same for (b).....	7-8	1 2-3	3	7
Cement for concrete (a).....	5 bbls.	9 bbls.	16 bbls.	40 bbls.
Same for (b).....	3 1-2 "	6 1-2 "	17 "	27 "
Mortar for (c) or (d), 2 1-2 parts }	1 1-2 yds.	3 yds.	5 yds.	11 yds.
sand, 1 part cement..... }	5 bbls.	9 bbls.	17 bbls.	37 bbls.
Brick (d) thousands.....	2 1-4 M.	4 1-4 M.	7 M.	17 M.

Approximate cost on the following basis:

Portland cement, \$2.50 per bbl. of 3 7-8 cu. ft.

Plain concrete in place, \$7.50 per cu. yd.

Reinforced concrete, \$8.50 per cu. yd.

Rubble masonry, \$5.50 per cu. yd.

Mason, \$5.00 per day, helper, \$1.75.

Brickwork in place—\$20.00 per thousand, \$14.00 per cu. yd.

Then for tank only, not including excavation or accessories:

(a) ..... For 6 and 7.....	\$22.50	\$45.00	\$65.00	\$160.00
(b) ..... unit price is less....	7.00	34.00	50.00	120.00
(c) ..... because of.....	22.00	44.00	70.00	150.00
(d) ..... larger quantity....	42.00	84.00	125.00	300.00
Accessories:				
2 vent pipes.....	.50	.50	.50	.50
Siphons, 1 or 2.....	1.25	2.50	2.50	2.50
Glazed pipe, 60 per cent. of list price:				
4-inch piece and elbow.....	.54	.54	.54	.54
3-inch piece and elbow.....	.42	.42	.42	.84
Tipper and handle.....		1.50	1.50	1.50
Blow-off—2-inch gate valve, pipe, }	6.50	6.50	7.50	13.50
and setting..... }				
Total for fittings.....	\$9.25	\$12.00	\$13.00	\$19.25

Under favorable conditions cost may be less, especially if the owner does much of the work himself. For concrete construction nothing is directly included for lumber for forms. If lumber is bought new for this and not used again, the cost may be a little more; but old lumber is good enough; it need not be planed, and joints or cracks may be made tight enough to retain the water of the concrete by using thick paper, or pointing with a little mortar.

## MATERIALS FOR THE TRENCHES.

A length of 4 yards or 12 lineal feet is assumed as about the least advisable for the smallest tank. Other lengths in proportion.

Gravel: Finer grade 1-8 in. to 3-8 in., 2 cu. yds.

Coarser grade 1-2 in. to 1 1-2 in., 1 1-2 cu. yds.

Lining-stone about 100 sq. ft., 6 in. thick, 2 cu. yds.

3-inch glazed pipe, distributors and collectors, 12 pieces.

Vent and telltale for pit (if made), 3 pieces.

T branch for pit, 1 piece

If screened gravel cost \$1.25 per cu. yd., and selected flat stone about the same, and pipe 8 cents per ft.,—60 per cent. off from list price,—the materials for this length of trench will cost about \$8.50.

## PUBLICATIONS.

Besides the references already given, for which the writer hereby acknowledges his indebtedness, the following works are recommended to any who desire to gain more extended knowledge of questions relating to sewage disposal. They should be procured for every town library:

"How to Drain a House," by Col. George E. Waring, D. Van Nostrand Company, New York, 1895, 12 mo., 225 pp., \$1.25.

"The Separate System of Sewerage," by Staley and Pierson, same publisher, 1904, 8 vo., 326 pp., \$3.00.

"Sewage Disposal," by L. P. Kinnicutt, professor of chemistry, Worcester Polytechnic Institute, Prof. C. E. A. Winslow in charge of Sewage Experiment Station of Massachusetts Institute of Technology, and R. Winthrop Pratt, chief engineer of Ohio State Board of Health, Wiley & Sons, New York, 1910, 8 vo., pp. XII and 436, and 104 figures and illustrations.

This new work by three leading experts, surveys the whole field, both as to theory and the latest research and practice in construction. It deals, however, chiefly with methods and works conducted on a large scale.



## FINANCIAL STATEMENT.

### EXPENSES OF THE STATE BOARD OF HEALTH.

*For the Year Ending August 31, 1909.*

Salary of Secretary (14 months) . . . . .	\$2,916.67
Salary of Clerk (14 months) . . . . .	583.33
Expenses of Board . . . . .	199.73
Printing Blanks . . . . .	62.03
Printing Report . . . . .	982.78
Incidentals . . . . .	90.00
Total . . . . .	<u>\$4,834.54</u>

*Expenses for the Year Ending August 31, 1910.*

Salary of Secretary . . . . .	\$2,500.00
Salary of Clerk . . . . .	500.00
Incidentals . . . . .	446.87
Printing Blanks . . . . .	18.85
Total . . . . .	<u>\$3,465.72</u>

### STATE LABORATORY OF HYGIENE.

*Expenses for the Year Ending August 31, 1909.*

Expenses, including Salaries . . . . .	\$4,976.63
Printing Blanks . . . . .	231.07
Incidentals . . . . .	100.00
Total . . . . .	<u>\$5,307.70</u>

*Expenses for the Year Ending August 31, 1910.*

Salaries of Chemists (2) . . . . .	\$2,671.62
Salaries of Bacteriologists (2) . . . . .	1,801.00
Incidentals . . . . .	1,060.32
Printing . . . . .	383.25
Total . . . . .	<u>\$5,916.19</u>

Receipts from Liquor License Commission, 1909 . . . . .	\$727.10
Paid out Salary Assistant Chemists . . . . .	\$707.50
Incidentals . . . . .	19.60
Total . . . . .	\$727.10
Receipts from Liquor License Commission 1910 . . . . .	\$780.00
Paid out Salary Assistant Chemist (2 months) . . . . .	\$120.00
Incidentals . . . . .	390.67
Total . . . . .	\$510.67
Balance on hand . . . . .	269.33
Total . . . . .	\$780.00

## SANITARY INSPECTION SERVICE.

*Expenses for the Year Ending August 31, 1910.*

Services and Expenses of Inspectors . . . . .	\$1,144.60
Laboratory Apparatus and Furniture . . . . .	1,187.49
Incidental Expenses . . . . .	167.51
Total . . . . .	\$2,499.60

## STATEMENT OF THE OPERATION OF THE EMBALMER'S LAW.

## RECEIPTS.

Balance on hand as per last Report . . . . .	\$215.69
Received for Licenses, 1909 . . . . .	110.00
Received for Licenses, 1910 . . . . .	70.00
Total . . . . .	\$395.69

## EXPENSES.

Paid for postage, printing, etc., 1909 . . . . .	\$66.80
Paid for postage, printing and filing case, 1910 . . . . .	144.55
Total Expenditures . . . . .	\$211.35
Balance on hand . . . . .	184.34
Total . . . . .	\$395.69

## EPIDEMIC FUND EXPENDITURES.

For the Fiscal Year 1909 . . . . .	\$25.00
For the Fiscal Year 1910 . . . . .	109.00



---

---

## INDEX.

---

---



# INDEX.

	Page
A brief on ways and means of having healthy homes and summer resorts . .	259
Advertising, false . . . . .	173
Allenstown—water supply . . . . .	16
Alstead, water supply . . . . .	16
Alton, water supply . . . . .	17
Amherst, water supply . . . . .	18
Anise, spirits of, examination of . . . . .	208
Andover, water supply . . . . .	19
Antrim, water supply . . . . .	21
investigation of . . . . .	229
Apoplexy, deaths from, 1884–1909 . . . . .	xxii
Ashland, water supply . . . . .	23
Auburn, water supply . . . . .	24
Bacteriological examinations made at the State Laboratory of Hygiene . . . .	243
Baking powders, examination of . . . . .	188
Bartlett, water supply . . . . .	25
Bath, water supply . . . . .	26
Belmont, water supply . . . . .	26
Bennington, water supply . . . . .	28
Benton, water supply . . . . .	29
Berlin, water supply . . . . .	29
Bethlehem, water supply . . . . .	33
Boscawen, water supply . . . . .	33
Bradford, water supply . . . . .	35
Bright's Disease, deaths from, 1884–1909 . . . . .	xix
Bristol, water supply . . . . .	35
special report on . . . . .	163
Brookline, water supply . . . . .	36
Butter, renovated . . . . .	182
law relating to sale of . . . . .	171
Camphor, examination of spirits of . . . . .	208
Canaan, water supply . . . . .	37
Cancer, deaths from, 1884–1909 . . . . .	xxiii
Candia, water supply . . . . .	37
Canterbury, water supply . . . . .	39
Celery salt, examination of . . . . .	188
Center Harbor, water supply . . . . .	39
Cesspool, a controlled . . . . .	277
modified, or sewage tank with subsurface disposal . . . . .	262
quantities of materials for . . . . .	292

	Page
Charlestown, water supply.....	40
Cider, examinations of.....	195
Claremont, water supply.....	41
report on, by Prof. Robert Fletcher.....	153
Cocaine law.....	171
Cocoas, examination of.....	189
Coffee and coffee substitutes, examinations of.....	188
Colebrook, water supply.....	46
Concord, water supply.....	47
Consumption (see Tuberculosis).....	
Conway, water supply.....	50
Cornish, water supply.....	52
Croydon, water supply.....	52
Dalton, water supply.....	52
Derry, water supply.....	52
Diphtheria, examinations in suspected cases of at the State Laboratory of Hygiene.....	243
deaths from, 1884-1909.....	xxvi
Disposal of household refuse in small communities, by Robert Fletcher, Ph.D.....	262
Dover, water supply.....	54
Drugs and proprietaries, examination of.....	205
Dublin, water supply.....	60
Dunbarton, water supply.....	60
Durham, water supply.....	60
Earth-closet, details of construction.....	282
Embalmer's law, statement of operation of.....	296
Enfield, water supply.....	63
Epping, water supply.....	65
Exeter, water supply.....	66
inspection of.....	234
Extracts, flavoring, examinations of.....	184
Farmington, water supply.....	67
Fish, examinations of.....	195
Fitzwilliam, water supply.....	68
Fletcher, Prof. Robert, report on Claremont water supply.....	153
disposal of household refuse in small communities....	262
Food, an act to promote the sanitary production and distribution of.....	169
Food and drugs inspection, by C. D. Howard.....	169
examinations, summary of.....	179
standards.....	171
Fracestown, water supply.....	68
Franconia, water supply.....	69
Franklin, water supply.....	70
report on new filter.....	231
Galvanized iron pipe, objections to for conveying water.....	6
Goffstown, water supply.....	73
Gorham, water supply.....	74
Grape juice, examinations of.....	199
Greenfield, water supply.....	75

	Page
Greenville, water supply.....	76
Groveton, water supply.....	118
Hampton, water supply.....	77
Hancock, water supply.....	78
Hanover, water supply.....	79
Haverhill, water supply.....	81
Headache wafers, examination of.....	209
Henniker, water supply.....	82
Hill, water supply.....	84
Hillsborough, water supply.....	84
Hinsdale, water supply.....	85
Honey, examinations of.....	195
Hooksett, water supply.....	85
Hopkinton, water supply.....	86
Hotels and boarding houses, inspection of water supplies.....	221
Howard, Charles D., examination of water supplies.....	3-150
report on food, drug and liquor inspection.....	169-218
the inspection of water supplies at summer hotels and boarding houses.....	221-239
Hudson, water supply.....	87
Ice cream, law amended.....	182
Infantile paralysis (anterior poliomyelitis), deaths from.....	xxvii
Iodine, tincture of, examinations.....	208
Jackson, water supply.....	88
Jaffrey, water supply.....	88
Keene, water supply.....	90
Kensington, water supply.....	92
Laconia, water supply.....	92
investigation of.....	236
special report on.....	160
Lakeport, water supply.....	93
Lancaster, water supply.....	94
Lead pipe, dangers of for conveying water.....	5
Lebanon, water supply.....	95
Lincoln, water supply.....	99
Lisbon, water supply.....	100
Littleton, water supply.....	101
Livermore, water supply.....	101
Lunacy, Board of Commissioners of.....	xii
Lyme, water supply.....	102
Madbury, water supply.....	102
Madison, water supply.....	103
Manchester, water supply.....	103
Maple products, examinations of.....	195
Marlborough, water supply.....	106
Meats, canned, examinations of.....	195
Meredith, water supply.....	106
Meriden, water supply.....	124
Merrimack, water supply.....	107



	Page
Milford, water supply.....	108
Milk, examinations of.....	180
sugar, examinations of.....	205
Milton, water supply.....	110
Molasses, examinations of.....	195
Nashua, water supply.....	110
New Boston, water supply.....	112
Newbury, water supply.....	113
Newfields, water supply.....	114
Newfound Lake, protection of waters of.....	163
New Hampton, water supply.....	114
New Ipswich, water supply.....	115
New London, water supply.....	115
Newmarket, water supply.....	117
inspection of.....	234
Newport, water supply.....	117
Northfield, water supply.....	118
Northumberland, water supply.....	118
Northwood, water supply.....	119
Nottingham, water supply.....	119
Oil, camphorated, examinations of.....	205
Orange, water supply.....	119
Orford, water supply.....	120
Ossipee, water supply.....	120
Oysters, examinations of.....	198
notice to dealers.....	196
Paugus Lake, protection of waters of.....	161
Pembroke, water supply.....	120
Peppermint, spirits of, examinations of.....	208
Peterborough, water supply.....	123
Pittsfield, water supply.....	123
Plainfield, water supply.....	124
Plaistow, water supply.....	126
Plymouth, water supply.....	126
Pneumonia, deaths from, 1884-1909.....	xxv
Portsmouth, water supply.....	128
Proprietaries and miscellaneous medicines, examinations of.....	209
Prosecutions under the pure food law.....	175
Raymond, water supply.....	129
Rochester, water supply.....	130
Salem, water supply.....	131
Salisbury, water supply.....	131
Salt, table, examinations of.....	202
Sanbornton, water supply.....	132
Sandown, water supply.....	132
<i>Sanitary Bulletin</i> , the New Hampshire.....	xii
Sanitary inspections.....	v
expenses of service.....	296

	Page
Sanitation, practical, aspects of.....	290
legal and personal, aspects of.....	291
Sewage, a controlled cesspool.....	277
chamber and kitchen, disposal of.....	286
disposal, in small communities.....	262
dry.....	281
quantities of materials for construction of tanks.....	292
materials for the trenches.....	292
water-borne, disposal of.....	262
Sewerage, modified cesspool or sewage tank with subsurface disposal.....	262
simpler contrivances adapted to special situations.....	281
Slaughter-house inspections.....	vi
Soda and tonics, examinations of.....	188
Somersworth, water supply.....	133
Spices, examinations of.....	195
Stark, water supply.....	134
State Board of Health, expenses of the.....	295
State Laboratory of Hygiene.....	ix
bacteriological examinations at.....	243
expenses of.....	295
State Sanatorium, the New Hampshire.....	xiii
Stove polish, inflammable, suit in case of.....	219
Stratford, water supply.....	134
Substitutes and imitations of food stuffs.....	175
Sugar of milk, examinations of.....	205
Sulphur, precipitated, examinations of.....	205
Summer-resort inspections.....	viii
Sunapee, water supply.....	135
Sutton, water supply.....	135
Swanzy, water supply.....	137
Tamworth, water supply.....	137
Tanks for sewage disposal, quantities of materials for construction.....	292
Temple, water supply.....	138
The inspection of water supplies at summer hotels and boarding houses, by C. D. Howard.....	221
The New Hampshire State Sanatorium.....	xiii
Tilton, water supply.....	138
special report on.....	161
Trench for sewage disposal, materials for.....	292
Tuberculosis.....	xiv
bacteriological examinations in suspected cases.....	243
in New Hampshire, 1884-1909, deaths from.....	xvi
Typhoid fever, deaths from.....	xxvii
examinations in suspected cases of.....	255
Vital statistics in New Hampshire.....	xiii
Walpole, water supply.....	140
Warner, water supply.....	141
Warren, water supply.....	142
Waste and garbage, disposal of.....	286

	Page
Water, drinking, protection of.....	287
Water supplies.....	v
examinations of, regulations governing.....	4
at summer hotels and boarding houses....	221
at summer resorts, summary of.....	14
objections to galvanized pipe.....	6
lead pipe.....	5
of cities and towns, examination of.....	3-8
summary of.....	8-13
special report on.....	153-166
Water, ways of contamination.....	288
Weare, water supply.....	144
Weights and measures, statutory provisions.....	172
Wells, construction of.....	289
Westmoreland, water supply.....	144
Whitefield, water supply.....	144
special report on.....	238
Wilmot, water supply.....	145
Wilton, water supply.....	146
Winchester, water supply.....	147
Winnepesaukee Lake, protection of waters of.....	161
Winnisquam Lake, protection of waters of.....	161
Wintergreen, spirits of, examinations of.....	208
Wolfeboro, water supply.....	147
Woodstock, water supply.....	148
Woodsville, water supply.....	149

NEW HAMPSHIRE AGRICULTURE

REPORT

OF THE

BOARD OF AGRICULTURE

FROM

SEPTEMBER 1, 1908, TO SEPTEMBER 1, 1910

BY NAHUM J. BACHELDER, SECRETARY.

---

PRINTED BY THE JOHN B. CLARKE CO., MANCHESTER.  
BOUND BY GEORGE G. NEAL, DOVER.



# BOARD OF AGRICULTURE.

ORGANIZED AUGUST 23, 1870.

MEMBERS 1909, 1910

HIS EXCELLENCY HENRY B. QUINBY.

JOSEPH D. ROBERTS, Chairman	Rollinsford.
GEORGE H. WADLEIGH, Vice-Chairman	Tilton.
ALDEN F. SANBORN	Fremont.
THADDEUS W. BARKER	Nelson.
EDWARD E. BISHOP	Bethlehem.
DANIEL C. WESTGATE	Plainfield.
HERBERT O. HADLEY	Peterborough.
F. HALE FLANDERS	Andover.
MILES W. GRAY	Columbia.
SIMEON O. HUCKINS	Ossipee.

NAHUM J. BACHELDER, Secretary.



# GENERAL REPORT.

---

## STATE OF NEW HAMPSHIRE.

### BOARD OF AGRICULTURE,

CONCORD, September 1, 1910.

*To His Excellency the Governor and the Honorable Council:*

### AGRICULTURAL SOCIETIES.

Various agricultural societies exist in the state organized for promoting special interests of the farmers, that are not financially supported by the state. Chief among these may be mentioned the Grange, the Sheep Breeders' Association, the Potato Growers' Association, and numerous poultry and fair associations. The associations in the state of an agricultural nature having financial support from the state are the Granite State Dairymen's Association and the New Hampshire Horticultural Society. The State Board of Agriculture has no authority over these associations except in the matter of the State Horticultural Society, the appropriation for this being made by the state with the provision that it be expended under the direction of the State Board of Agriculture. In addition to this the State Board of Agriculture is authorized by law to encourage the formation of farmers' clubs and agricultural and horticultural societies, which has been done; also it has encouraged and assisted the formation and work of societies and associations engaged in promoting agricultural matters in their various phases. This work has been given no inconsiderable attention by the State Board of Agriculture, through its secretary, as an effective means of aiding the farmers and the agricultural interests of the state.

## FARMERS' INSTITUTES.

Farmers institutes have been held in every county of the state, and a report of the more important and of the exercises as required by law will be found in this volume. These institutes have been generally held upon invitation of subordinate granges, which have furnished halls and contributed to the literary exercises. They have been accorded a large attendance and have stimulated an interest in progressive agriculture. The speakers have included representatives of the Board of Agriculture, Agricultural College, and Experiment Station, State Grange, and expert scientists from outside the state.

## PUBLIC MEETINGS.

Public meetings have been held at Contoocook and Exeter and field meetings at Hampton. These were well attended, and the more important addresses are given in this report.

## SUMMER HOMES.

The work of developing the summer industry through the sale of abandoned and other farms has been continued, and a lengthy statement in regard to the matter will be found in this report. Ten thousand copies of publications for this purpose have been widely distributed and several thousand letters of inquiry have been given special attention. There is every reason for continuing this work and perhaps upon a more extensive plan than the present.

## FEEDING-STUFF INSPECTION.

The agent of the Board of Agriculture sampled one hundred and four brands of feeding-stuffs in 1909 and one hundred and thirty-five brands in 1910, which were analyzed at the New Hampshire Agricultural Experiment Station and the results published in this report. The present feeding-stuff law should be amended, giving the state greater control in the inspection and analysis of commercial feeds.

## FERTILIZER INSPECTION.

In the fertilizer inspection in 1909 the number of samples taken was one hundred and thirty-eight, and the same number in 1910. These samples, as in the case of feeding-stuff samples, were drawn from dealers' stock in all sections of the state and analyzed at the New Hampshire Agricultural Experiment Station. The results are herewith published.

## SEED TESTS.

The legislature of 1909 enacted a law imposing upon the Board of Agriculture the duty of seed testing. This was progressive legislation of the most important nature, and has been effectual in improving the quality of seed offered for sale in the state. The result of action under the law is published in this report.

## VARIOUS MATTERS.

Various matters which have received the attention of the Board of Agriculture, including contagious diseases of animals, and the work of various agricultural organizations, are treated at more or less length in this report, to which reference is herewith made, and detailed report of the work and suggestions in regard to laws authorizing it.

Respectfully submitted,

N. J. BACHELDER,

*Secretary.*





## INSTITUTES AND MEETINGS.



# INSTITUTES AT HOLLIS, HUDSON, AND MEREDITH.

---

## HOLLIS.

The first of the series of farmers' institutes during Christmas week was held on Monday, December 21, under the auspices of the State Board of Agriculture at the Grange Hall in Hollis, on the invitation of the grange in that town, and the institute workers were given a cordial greeting and were accorded a large audience. H. O. Hadley, master of the State Grange and county member of the Board of Agriculture, presided. The speakers of the day were men well known throughout the state as specialists in the line of farming, and they spoke of subjects of interest to the people of the community. They included Prof. Fred Rasmussen of the New Hampshire experiment station, Prof. L. A. Clinton of the Connecticut station at Storrs, H. O. Hadley of Peterborough, and N. J. Bachelder, secretary of the Board of Agriculture.

The afternoon session of the meeting opened with the invocation made by the Rev. C. H. Davis. An address of welcome was given by the Hon. Franklin Worcester, to which Secretary Bachelder responded in an appropriate manner. The first subject discussed was "How to Increase Profits in Dairying," and was thoroughly explained by Professor Rasmussen. The subject of his lecture will be given in a later report. He was followed by Professor Clinton on

## MAINTAINING SOIL FERTILITY.

It is hard to establish any definite facts about the richness of the soil, and equally hard to discuss them, but there are certain truths that are common to most localities under

varying conditions. There are four essential points connected with this subject and under which it is generally discussed: how the fertility gets into the soil, how it gets out, how to prevent it from getting out, and how to restore it are the subtopics into which we will divide this talk on maintaining soil fertility.

Soil is a mixture of stone that has been ground up and pulverized by the glacier period and deposited all over North America, and decayed and decaying plant and vegetable matter. The kinds of soil depend on the degree of fineness with which these rocks, the remnants of the stone age, and the organic matter have attained. There is the clay soil to which the water clings tenaciously, and the gravel loam that acts like a sieve for rain water. The fertility depends on the amount of humus, the amount of organic substance or plant food, and whether a crop can be raised on it that may be sold for more than the cost of production.

Many soils are depleted in fertility by Nature's actions, by surface erosion, by bacteria growth, leakage and surface tightness. These things rob the soil of its vitality. An average corn crop when analyzed yields but two or three percent plant food that has been taken from the soil. The main loss in New England takes place during the winter from the rains and storms, which carry off the valuable surface of the land.

This wasting of fertility can be prevented by having some crop, it makes not much difference so long as it is a living one, growing on the cultivated fields out of season, during the winter and early spring. Rye and oats are common crops that are grown. In the spring this off season should be plowed under, making its green food life available for more profitable crops. Some fields are low and contain much water, which, if allowed to stand, makes the soil logy and stagnant, and locks up the organic matter. In this case underdrains situated at the right places will carry off the superfluous moisture.

Another method along this same line is the use of lime,



spread judiciously over the earth, not eight or ten tons to the acre, but two or three. The application of the lime loosens up the plant life and cures the acidulous soil. Experiments in the use of lime have shown that soil on which lime had been placed always gave the best results. The use of stable manure is questionable when it has been allowed to stand outside the barn in all kinds of weather, because it has lost most of its organic substance. If manure is to be used, it should be taken to the field, immediately spread and harrowed in. This is impossible in the winter, and then it should be stored in a square, tight pile on the field and used in the spring. A satisfactory commercial fertilizer, I have found, consists of 250 pounds of nitrate of soda, 200 pounds of acid phosphate, and 150 pounds of muriate of potash.

The next speaker was Chairman Hadley, and he discussed

#### THOROUGH CULTIVATION OF THE SOIL.

A large part of the success and failures in agriculture are due to the thorough or the hurried preparation of the soil, to the loosening or the tightening of the plant life in the soil. I remember when I was a small boy my father was not particular in the way he plowed his fields, and if he struck a stump or a stone the quicker he could get his plow in ahead the better. His usual recipe for harrowing used to be to take the old spike-tooth harrow and run it a couple of times each way of the field.

Under present conditions the methods of cultivation are entirely different and hardly resemble the old-fashioned ways. Today every section of the field is given a thorough plowing, not a particle of the sod is left unturned, and the soil is pulverized very fine by the use of the disk and cut-away harrows, leaving it level and dusty.

When the crop is planted, and before it comes up, harrowing is of vast importance because it stops the growth of weeds and makes the cultivation free and easy and loosens up the plant matter, giving the seed an excellent chance to

germinate. The cultivation of such crops as corn and potatoes should be carried on with horse and harrow so long as it can be done without damaging the plants. This should take the place of the expensive hand hoeing. Another thing thorough cultivation does is the saving of the water originally deposited in soil. It is the natural course for the water to rise on account of capillary attraction up the stems of the plants, and then evaporate into the air. The continual harrowing leaves a thick layer of dust or a mulch subsoil, as it is called, that prevents this action, and acts as a layer of straw would when placed on a field.

I say to you farmers here today that only the thorough cultivation of the seed bed and the thorough cultivation of the growing crop will widen the cost of production and the selling price, and will make New Hampshire agriculture what it ought to be—ahead of the same industry in all the other states of the Union.

Secretary Batchelder spoke on "A Profitable Crop."

A bountiful supper was provided after the afternoon session for the institute workers and for those farmers who had come from a distance. The afternoon speeches were interspersed by a reading by Miss Bessie N. Woods and musical selections by Miss Belle I. Gilman. The secretary of the board and his party visited the poultry plant of H. A. Wilson, which consisted of over twenty buildings, harboring five thousand white Plymouth Rocks in fine condition.

Professor Rasmussen opened the evening session with the subject,

#### RELATION OF THE EXPERIMENT STATION TO THE FARMER.

We are all interested in this subject. The experiment station is interested and hopes that the farmer is also. The people here in Hollis are in closer touch with the New Hampshire experiment station than any other town in the state. The state does not support the station, but the maintenance falls to the federal government. Money has been

appropriated yearly until we have now eleven thousand dollars for the experiment work. There are seven stations at the college prepared to give advice and assistance to the farmers of New Hampshire along the following lines: The maintenance of soil fertility, including the rotation of crops and the selection and the use of manures and fertilizers; the selection of varieties of grain, grasses, and forage crops and methods of culture; the selection of fruits and vegetables and the management of orchards; the examination of seeds, the identification of different plants; the prevention of fungous diseases; the identification of insects and control of such as are injurious; the feeding of animals, including calculations of rations and methods of feeding stuffs; the methods of milk production and the testing of milk to determine value of dairy cows; the planting and caring of trees.

There is one question that we are often asked, "Why don't you get out more among the farmers?" We reply that the money has not been devoted for that purpose, but we had rather do it and could do far better work if we did. All our results now in experiment work are circulated by bulletins. In Iowa the state has appropriated money for extension work, and short free courses and coöperative experiments in localities having the same conditions are being held all over the state. This gives the people faith in the station, and I am sure if we could get in as close touch with the farmers in New Hampshire the result would have a greater influence on agriculture than those obtained from the present methods.

There is one phase of the experiment station that the farmers are neglecting. Last summer we inspected over a hundred farms in the state and were asked many questions that have arisen during the last three years about farming that might have been answered through the mail. Sometimes even a postal will give the desired information. Even when we did get out there were some people who were suspicious of our actions. We are not trying to act as police,

but are trying to find out what the people are doing, and then we will try to help them.

Besides coöperation between the farmers and the experiment station there should be local coöperation among the farmers themselves. It has been started on a small scale for the improvement of the cattle. In the northern part of the state a local dairy association has been formed by some twenty or thirty farmers, who have hired a man to test the produce of each cow once every month, measure the feed and see if the cow is up to her limit of production. The work of this man begins January 1. In other states of the Union there are these same organizations. Many problems can be solved by local coöperation that will prove beneficial to the community and to the individual.

Professor Rasmussen's discussion was followed by lectures by Professor Clinton and Mr. Hadley on "Potato Growing" and "Good Citizenship," respectively, and the important issues of their speeches will be given in a later report.

Secretary Bachelder brought the institute to a successful close with a speech on

#### THE NATIONAL GRANGE.

When I first became connected with the State Board of Agriculture, more than twenty years ago, the conditions in this state were entirely different from what they are to-day. The board was at war with the grange, the grange and the board were fighting the experiment station, and the people were down on all three. I believe today that it is just as important for the board of agriculture, in this state or any other state, to support the grange, as it is to work in the interests of crop growing. Today the board is entitled to credit for the harmonious state of affairs, and the grange for the support that it has given the board in helping to unite the three different farmer factors at work in the interests of the New Hampshire farmer.

At the present time granges are in existence in thirty states of the Union, stretched from ocean to ocean, have a membership of over a million people, have doubled their membership within the last ten years, and have added twenty thousand during the last year. The National Grange is a large institution, and in New Hampshire has members to the number of thirty thousand. New Hampshire ranks fifth among the states. The National Grange is an important organization and so are the state granges, but it is from the small subordinate ones that these two derive their power.

There is no agency in the state working in the interest of the rural people, excepting the church and the school, that has done more for the farmer than the grange. At a hearing of the "Up-Lift" commission, appointed by President Roosevelt to find out "What is the matter with the farmers," at Washington, I strongly recommended and firmly believe that the best report that the commission can make to the President is to help to establish subordinate granges in every country town and at every crossroad. The grange is playing an important part in the development of young men and is fitting them for responsible public positions, where they will be more favorable to the interests of the farmer than any other class of people.

You hear a great deal about the farmer not being able to fill public positions, but he hasn't had the chance. There are now forty thousand young men whose ages range from fourteen to twenty-one, who are presiding at grange meetings, taking part in the discussions and ritual work, that are being well trained and will be qualified to send to legislatures, to fill gubernatorial chairs, and to congress.

The grandest work, though not the important, is the legislation obtained for the farmer, through the efforts of the National Grange. During the last thirty years the department of agriculture has been established at Washington, the secretary made a member of the President's cabinet, rural free delivery, the interstate commerce, and the pure



food laws have been passed. More legislation will be attempted at this session of congress. The National Grange will stand for federal appropriation for highways, parcels post and postal savings banks. If we do not get what we want this year we will try next.

Between the speeches of the evening William L. Marshall gave a reading and the Misses Bertha M. Hayden and Annie M. Colburn entertained the audience with a duet. At the close Chairman Hadley voiced the appreciation of the board of agriculture in thanking the people for the interest that they had taken in the institute.

### HUDSON.

The second farmers' institute of the week was held at Hudson on Tuesday, December 22, in the association hall by the State Board of Agriculture on the invitation of the grange of that town. Both the morning and afternoon sessions, in spite of the Christmas holidays, brought forth a large number of farmers. The speakers at this institute were those who spoke at Hollis the day before and the subjects were the same. The invocation made by the Rev. F. A. Tyler was followed by the address of welcome by Arthur S. Andrews, master of the Hudson grange. Chairman H. O. Hadley introduced Professor Rasmussen as the first speaker and announced that his subject would be

### HOW TO INCREASE THE PROFITS IN DAIRYING.

From a recent study of the dairy conditions in the state carried on by the experiment station, it was found that many farmers were making a small profit out of the dairy business. Many of these men, when asked for the reason, would answer that grain was too high and there is no profit in the dairy business anyway. It was found that many of these men had no definite idea as to what constituted a good dairy cow, they were not breeding for a particular purpose and they had no desire to study into the whys and wherefores of things, and, worst of all, they lacked faith.

Improvement in the dairy herd and a consequent increase in the profits can be accomplished along the following lines:

First, in order to improve a dairy herd the owner must decide upon a particular breed. He should select the breed which he likes best and which is best adapted to his conditions, taking into consideration the general condition of his farm and the market for his product, whether he wishes to sell milk, cream or butter.

Secondly, buy a pure bred registered sire, as the most rapid improvement of the herd must come through the dairy sire. The fact that he is registered is not always a guarantee for excellence. He must be a good individual of the dairy type. His ancestors must have been good producers of milk and butterfat. A good, pure-bred bull used on grade cows is sure to give improvement, as the strong characteristics of the pure-bred bull will impress the offspring much more than the weaker blood of the grade cows. It is considered easier to get good results from breeding a cow to the pure-bred bull than it is to get good results from the crossing of two pure-bred animals together, as the strong characteristics in the pure-bred animals do not blend well, and the result may be that some undesirable dormant characteristic will have a chance to predominate.

Thirdly, by keeping the records of the production of milk and butterfat of each cow. The value of knowing the exact production of each animal is a matter of greatest importance, both from the standpoint of intelligent feeding for the greatest immediate profit and from the standpoint of selection of calves for breeding purposes.

Fourthly, by better methods of feeding.

It is a common mistake not to feed a cow enough. The amount of food it takes to keep a cow in a state of equilibrium, neither losing nor gaining, is called a maintenance ration. As the cow's feed is increased there will be a corresponding increase in the amount of milk until the cow's limit of production is reached, and this limit of production can only be ascertained by a careful comparison of the

amount of food consumed and the amount of milk produced. The two principal methods to be observed in feeding dairy cows is the compounding of the ration, considering the composition and the prices of the foodstuffs and the amount of ration to be fed.

Fifthly, by prices for dairy products.

More can be done towards the increasing of our profits by improving our stock by selection and better methods of feeding, by better stabling, by more coöperation in buying and selling of products, than can be hoped to be gained by a further increase in prices. Furthermore, the advancement we make along these lines is permanent, while the prices will fluctuate with supply and demand.

At this point Professor Clinton and Chairman Hadley spoke on "Maintaining Soil Fertility" and "Thorough Cultivation of the Soil," treating their subjects in the same manner that they did the day before at Hollis. The last lecture of the morning was delivered by Secretary Bachelder on

#### A PROFITABLE CROP.

I know of no other crop that can be grown to a profit in any part of the state to which the conditions, the soil, and the climate are more favorable, and that can be grown on most every farm, that requires so little care and work, than a crop of winter apples. The rocky, hilly land of New Hampshire, with its gravel type, furnishes an ideal place for an apple orchard.

Another crop that we can plant that will give just as great a return if not greater for the work than winter apples is a crop of pine trees. I know of no other state in the Union that has greater facilities for growing the pine tree. It does not require great experience to grow either one of these crops, and the harvest is a long way ahead, but I can give evidence if desired that will convince you that there is a larger net profit from a crop of winter apples or pine trees

than from any other crop that may be produced by the New Hampshire farmer under similar circumstances.

Still, it does not make so much difference what we raise as how we raise it. I believe that agriculture can be made just as profitable in New Hampshire as it has been made in the past. I believe there is just as great an opportunity to raise the right crops and sell them in New Hampshire as in any other state. I believe that the farmer of today has just as good chance as he ever had. The cities afford good markets and the summer business is booming the trade of the farmer and giving him a chance to sell his produce for good prices. There are many thousands of dollars going out of the state annually for products for which the farms of the state are especially adapted.

Crops can be made profitable by the study of conditions on each farm, by finding out what crop can be grown for a profit under existing conditions, why we do certain things and why we get certain results. If the farm is fitted for corn, grow corn; for oats, grow oats; and if the nearby towns are sending away yearly many thousands of dollars for produce that you can grow on your farm, grow it and stop the importing.

With more interest, more energy, more work, more studying of the market and the soil, the farmers can grow many profitable crops in New Hampshire.

Between the morning and the afternoon sessions a dinner was served by Hudson grange, conducted by the following ladies: Mrs. F. M. Cummings, Mrs. E. A. Holt, Mrs. F. A. Hills, Mrs. Andrew M. Ober, Mrs. Sylvia Estes, Miss Ethel Connell, Miss Maude Fay, Miss Cora Davis, Miss Ruby Sanders, Miss Hazel Sanders, Miss Marion Chase, Miss Ruth Mollendy and Miss Marion Walch.

Professor Rasmussen opened that afternoon session with an address on "Relation of the Experiment Station to the Farmer," and treated his subject the same as the day before. Professor Clinton followed with

## MODERN METHODS OF POTATO GROWING.

Success in potato growing depends on a few things, but these few things must be most carefully looked after. The first thing to consider is the selection of the seed. Home-grown seed, if properly grown and properly cared for during the winter, is just as good as seed coming from Maine or any other state. Potatoes for planting should be of medium size and should come from a section of the field that has been grown for the purpose of obtaining seed, and should be taken from the hill that gives the largest yield. In cutting the seed care should be taken to have pieces of good size, with at least one or two buds. The slice part should come from the heart of the potato. As potatoes should be cut for seed it will require about twelve bushels to properly plant one acre.

The field on which, if potatoes are grown, gives the best results is a field that has been grown the year previous with corn. The soil should be of a light or sandy or gravelly loam type. Plowed over turf land gives poor crops, for it is infested with the wire worm and the May beetle. In fertilizing potatoes the amount and the kind should be governed somewhat by local conditions. I have found in my practice that about 600 pounds, consisting of 250 pounds of nitrate of soda, 250 pounds of acid phosphate and 100 pounds of muriate of potash, is the maximum mixture for the most economical results. This material should be sown broadcast a couple of weeks before planting, and well harrowed into the soil.

At the planting time, which should come early in the season, the last of April or the first of May, rows should be opened up three feet apart to a good depth and the potatoes planted fourteen inches apart.

The rows may be covered with a double-mold board plow, the shovel plow or even with the cultivator. Cultivation should begin even before the plants are up from the ground, to loosen up the soil, to prevent the moisture from evaporat-



ing, and to free the field of weeds. When the potato sprout comes up and the plant increases in size, the field should be gone over continually with a fine spiketooth harrow until it is impossible for the horse and harrowing machine to go on the field without damaging the crop.

Potato bugs and blight are the greatest enemies of the crop. The best spraying chemical I have found for the bugs is arsenic of lead, which gives better results than Paris green and is not so inconvenient and dangerous to handle. The blight can be guarded against by constant spraying, especially during the month of August, with the Bordeaux mixture. If one or four acres are to be sprayed it is best to have a gasoline engine to furnish the power, which is more satisfactory than the horse machine.

The best time to sell potatoes is when you have them to sell, because it requires extra work to store them, and because there is a large loss due to evaporation.

Chairman Hadley was the next speaker and his subject was

#### GOOD CITIZENSHIP.

The citizenship of our country depends on three things, the civilizing of emigrants from foreign countries, the education of their children, and the education of the old American stock back in the country.

Our officials are having hard work to better the conditions of the foreigners, but, on the other hand, their children are showing a wonderful appetite for learning and are being influenced by the church and the state more than we realize.

It seems to me that the old American stock away from the large cities and towns are not encouraging and cultivating educational facilities in the way they should. A short time ago I had to gather some data on this subject, and I was surprised to find that only one out of thirteen country boys and girls who graduated from the graded schools ever went to the high school. The grange is now playing an important part in benefiting the educational chances of the

young people, and since 1899 has obtained through legislation money and state aid for this purpose.

The grange is itself teaching its members the principles of good citizenship. The first duty of a good citizen is in supporting liberally the church and the gospel in his own town, even if he is not affiliated with that church. Denominational lines are fast breaking down, as they are all different paths to the same great end.

The second duty is paying the school tax and taking a strong interest in the education of the young people by visiting the school and seeing what is being done. Do not send your children to school and not inquire what they are accomplishing from one year to the other.

The third duty is interest in good roads. One mark of good citizenship is to build good highways, because it is over them that we go to mill and to meeting. Elect a man for road builder who is familiar with the work of the office, irrespective of what party he belongs to, and keep him in office. It has been the work of the grange in improving small pieces of roads in different parts of the state, and, although they do not connect the state from one end to the other, they afford practical lessons in road building to the people.

The fourth and last duty is the loyal support of your country, your state, your county, and your own home. The interest in your home town or village comes in. Take an active part in affairs of the town, and do not run down your calling as farmers. Stand up for your occupation and stop the cry of abandoned farms in New Hampshire. There is now just as good opportunity in this state as there ever was to get a home, to make money, and to develop the strong character of the American citizen.

Chairman Hadley brought the institute meeting to a close with brief remarks on the National Grange, and thanked the people in behalf of the board for the attention and interest they had given the speakers. The exercises of the morning

and afternoon outside of the speaking included selections by the grange choir, Miss Daisy Wilson and Mrs. Anna Morris. Miss Marion Welch, a talented young lady, gave an excellent reading.

### MEREDITH CENTER.

The last farmer's institute during Christmas week was held at Meredith Center on Wednesday by the State Board of Agriculture, upon the invitation of Wicwas Lake Grange of that town. There was an appropriate response to the work of the board in arranging for this meeting in a large attendance. The same speakers who lectured at the meetings at Hollis and Hudson in the last two days spoke, but upon different subjects, as conditions around Meredith are different from those in the southern part of the state. G. H. Wadleigh, county member of the Board of Agriculture, presided. The invocation by G. L. Corliss, chaplain of the grange, was followed by an address of welcome by Arthur Brown, master of Wicwas Lake Grange. Chairman Wadleigh responded. Professor Rasmussen was first given the floor, and he treated his subject, "How to Increase Profits in Dairying," much the same way as he did at the last two institutes. Professor Clinton spoke on

### SEEDING AND MANAGEMENT OF GRASS LAND.

This subject is an important one for the New Hampshire farmer, as more than 75 percent of the tillable lands in the state are devoted to the growing of grass, and hay is by far the largest crop grown. In preparing land for grass, it is important that the surface soil be well pulverized and fine, for grass does not start well on a field whose soil is loose and mellow to the depth of the furrow slice. I have found that grass grows well on land from which an early crop of potatoes or corn has been taken, and that has been well harrowed in preparation for the grass seed and not plowed. If it is desired to reseed a piece of grass land, it is best to cut the grass crop early in July, then plow and harrow,

and seed about the first of August. Under the surface soil there should be a firm compact subsoil to the depth of at least eight inches, which helps the moisture to come up to the roots of the plants, and if the grass has been planted in the fall stops winter killing by preventing the roots from growing too deep and not being able to rise and fall with the upheavings of the land. The work of the harrow will give these two conditions of the soil, for the teeth cuts the soil and the tramp of the horse's feet settles it.

I have found by experiment that the following mixture for grass seed gave me the best results: Eight quarts of herdsgrass, six quarts of redtop, four pounds of red clover, and two pounds of alsike clover. This amount is enough to seed an acre if the land is well fitted. After the seed is sown I prefer to harrow it lightly, using for this purpose either the moving harrow or the weeder. Whether the ground should be rolled should rest with the farmer himself, who should judge from the local conditions. The matter of fertilizer must also rest with the farmer, and should be governed by the condition of the field. If stable manure is to be used, it should be spread before the seed is planted and well harrowed in.

The New England farmer is especially interested in the reseedling of the old pasture lands and in making this rocky, hilly land pay. In the first place all the old brush should be cut off, and then by the applying such fertilizers as lime, manure, and commercial, consisting of nitrate of soda, acid phosphate, and muriate of potash. Lime can be used where the soil has been found when tested with blue litmus paper to be acidulous.

The average amount of hay that I expect from an acre is from two and a half to three tons, and I am satisfied that most any land in New Hampshire will yield that, if properly taken care of. After all, there are no special methods of growing grass, no fixed rules where to plant and when to plant, for I have raised good crops by planting at all times of the year, in all kinds of soils, among growing crops of

corn, rye, and oats, and have used many varieties of fertilizers. The best method is the one that will yield the best profit on your own individual farm.

The following speaker, H. O. Hadley, told his listeners "How to Increase the Corn Crop," and discussed his subject in substance as follows:

I believe that the average New Hampshire farmer makes a big mistake in not planting and raising more corn. There is no necessity of paying the high price for grain when it can be grown on our own farms. There are three essentials in my mind that figure in producing a good corn crop, and they are good seed, thoroughly prepared seed bed and a thorough cultivation of the growing crop.

The seed should be selected a year ahead, properly traced and tied up, and kept in a dry place. It should be selected from one corner to which special care has been given, or from some early matured ear, which is symmetrical in form and shape, and on which the kernels are well developed. The only safe way is to make the germination test, which consists in cutting out some kernels from different ears of corn, placing them on squares on a marked piece of cloth, covering with moist sawdust, and placing on top another piece, and letting set for a few days. Then peel off the cloth and the sawdust, and the whole story is told. Pick the ear from which the most kernels came that sprouted in the sawdust, and the best should be ninety-five percent of all the kernels on one square.

The seed bed should be thoroughly plowed, every particle of the sod should be turned over, and then by using the cutaway, the disk and other harrows it should be made a perfect garden, so far as it pertains to smoothness and looseness of the soil. A clay subsoil is best for corn. For fertilizer I have found that stable manure gave good results. Do not buy ready mixed fertilizers, but buy your own chemicals and mix them yourself. The fertilizer that I use on



my farm is made up of the following: One hundred and fifty pounds of nitrate of soda, 600 pounds of acid phosphate, 150 pounds of muriate potash and 200 pounds of tankage. All fertilizers should be sown broadcast.

The cultivation of the crop is, as I have already said, an essential factor towards raising a good crop. Thorough harrowing before the seed sprouts gives the field a chance to retain its moisture by leaving two or three inches of mulch soil, through which the moisture cannot pass and evaporate into the air. It is easier to control a corn crop in dry weather than in wet, for this reason. It is customary on my farm to run the smoothing harrow before the planter, in order to loosen up the soil, to stir up the plant food, and to give the seed a good chance to germinate free from weeds. When the corn is up, do away with all hand labor by continual harrowing to stop the growth of weeds, to loosen up the organic matter in the soil. Do this until the plant is up six inches, until it is impossible to go on the field with the harrow without damaging some stalks of corn.

Mr. Hadley's address brought the afternoon session to a successful close. An excellent supper was served the institute workers and the visiting farmers by the ladies of the grange. At the following evening session Professor Rasmussen gave the last address on

#### FARM BUTTER MAKING.

We will consider this subject after the cream has been obtained under the best conditions as possible. Up to the point of ripening the dairyman has been trying to keep his cream as free as possible from bacteria and to check the growth of it. The first step is the caring for the cream when it is ripening, or the souring. Most of the butter made in this country is made from sour cream, because sweet cream butter to most users tastes flat and insipid. The souring of the cream must be handled in such a way and at

such a temperature that bacteria growth that produces desirable flavor will be developed and the undesirable ones checked. I have found that the right temperature is between 60 and 70 degrees. A starter is nothing more or less than nicely soured milk that contains the right kind of bacteria. During the process of ripening the cream should be stirred to prevent lumps of curd forming and to keep bacteria evenly distributed.

The second important thing is the churn. I have found that the barrel churn gives the best results. The process of churning consists in gathering together the small lumps of fat in the cream into one mass. The time it takes to churn depends on the temperature of the cream. If the cream is warm, butter will come quickly; if it is cold, the opposite result is obtained. The temperature of the cream should be taken and then regulated so as to give butter after thirty-five minutes. With the different seasons of the year, the temperature varies. I have found that it ranges from 50 to 60 degrees, and is lower in summer than in winter.

The third step is in working the butter after it has been taken out of the churn. For the working of the butter some form of table worker is best to use. The butter bowl and the paddle never give good results, because the butter will almost be invariably greasy and there is a chance for dirt to get in if great care is not taken in using a hand board. The table workers used are of two kinds—one having a stationary bed and roller, the other a movable bed revolving on a center. Both these machines will give good results. During the process of working the butter should be tasted frequently to determine its saltiness, and if too much salt has been added pour a little cold water on and it will wash out some salt.

The size and style of package in which the butter is to be placed should depend on the market conditions where the butter is to be sold. While great stress has been laid on the quality, it must be borne in mind that most people buy from

appearances and will choose a package of butter that is neat and clean quicker than one that has been done up in a slovenly manner. I do not approve of molds to place a print on the butter, because it takes time to clean the mold, and there is danger from unclean mold. Butter should be done up in small packages in parchment paper, with the owner's name printed on.

Professor Clinton and Secretary Bachelder also spoke on "Potato Growing" and "The National Grange," in about the same way as at Hollis and Hudson. The exercises of the afternoon and evening were interspersed by selections by the grange choir and a reading by Mrs. Rachel Smart. The institute ended with thanks of the board, extended through Chairman Wadleigh, for the support that the farmers of the community gave the institute.

## INSTITUTES AT MUNSONVILLE, SURRY, LEMPSTER, AND GRANTHAM.

---

### MUNSONVILLE.

The last of the series of farmers' institutes for the year of 1908 was opened by an institute in Munsonville by the State Board of Agriculture, on the invitation of Granite Lake Grange, on Monday, December 28. The speakers included Prof. H. E. Cook of Denmark, N. Y., Prof. Fred W. Morse of the New Hampshire experiment station, H. O. Hadley, master of the State Grange, and the secretary of the board. Representative farmers from the neighborhood, almost to the number of two hundred, attended the afternoon and evening sessions. County member of the Board of Agriculture, T. W. Barker, presided. The invocation made by the Rev. J. H. Vincent was followed by an eloquent address of welcome by C. B. McClure, master of Granite Lake Grange, to which Chairman Barker responded. The afternoon session was opened by Professor Cook with the topic

#### DAIRY FEEDING FROM A NEW STANDPOINT.

I have come to the conclusion that the dairy business in this country has been founded with manure as the main product and milk as a by-product. The dairy business had been promulgated by pasturing the cows in two types of fields in hope of restoring the fertility to the soil, one of which never had any organic substance, and the other has lost it through continual cultivation of the same crop. But it is not necessary to keep cows for this purpose, for, in

the first place, they rob the soil of its humus, and in the second the dairy pasture lands are the poorest in the country, and I cite the old pasture lands. The only way to raise the dairy cow and her milk to the same level as the iron or steel industries, and to make manure a by-product, is to have a pair of scales in every barn, weigh the milk and place each individual cow on the cost of her production. From this it can be readily seen that foodstuffs are going to figure prominently in the profits of dairy business. A few years ago western feeds could be bought cheaper than the farmer in the East could afford to raise them, but now the time has come when the eastern farmer in the dairy business, if he wishes to make money, must produce the foodstuffs for his cattle on his own farm, or produce something that will sell for enough to pay his dairy feed bill. Otherwise, I say, there is no money in this business.

Last year in New York I raised enough potatoes and cabbages to pay the cost of grain for my cows, which amounted to over four thousand dollars, and the same can be done in New Hampshire. I recommend to you farmers the growing of oats and peas to substitute in place of the western grains: alfalfa, which depends not on the soil of the climate, but is a question of soil condition; beets, which can be made to take the place of concentrated feeds at the rate of sixty pounds of beets for six pounds of grain; pumpkins, which give a larger material yield than any other crop; buckwheat and India wheat, which are good milk producers, and, lastly, millet. Sooner or later the eastern part of this country will be thrown on its own resources, and then will come better methods of tillage, use of chemicals for fertilizers and the growing of the better part of the nitrogenous foods.

Secretary Bachelder spoke on "The Farmer's Opportunity." Before and after the afternoon speeches the Misses Emily Barrett and Clara Page rendered musical selections. Mrs. T. W. Barker delivered a finely written essay on Presi-



dent Roosevelt's "Country Life Commission." Between the sessions a farmers' supper was served to the institute workers and to those farmers that had come from a distance by Granite Lake Grange, conducted by the lady members. The evening began with an entertaining reading by Mrs. C. B. McClure, and then Professor Cook lectured on

#### FERTILIZERS.

I deplore the fact that many New Hampshire farmers are guilty of buying ready mixed commercial fertilizers, which contain small amounts of plant food, and are looking at the quantity of the fertilizer, and not what is in it. A satisfactory fertilizer I have found to contain 400 pounds of nitrate of soda, 1,100 pounds of acid rock, and 500 pounds of muriate of potash. I omit tankage because I believe that a field that is so far depleted as to need nitrogen during the cultivating period needs plowing and seeding with rye or oats, which should be later plowed under. I omit any form of bone because I believe in fertilizing for immediate results, and bone fertilizer furnishes plant food for the next year. I recommend acid rock instead of the raw rock because the soil in New England has not the amount of organic substance available as other sections of the country; and muriate of potash instead of sulphuric, since it is cheaper and contains the same amount of plant life. Another good combination of chemicals includes 1,500 pounds of acid rock and 500 pounds of muriate potash, with the nitrate of soda stored in the barn to be used as the soil demands it. In New England there is more nitrogen in the soil than either phosphoric acid or potash.

The standard price for nitrate of soda is \$52 a ton, for acid rock \$13, and muriate potash \$44, and one ton of the first fertilizer that I have given, figured on this basis, would cost \$28.40. The chemical analysis would show 3 1-5 percent of nitrogen, 7 7-10 percent phosphoric acid, and 12½ percent of potash, which is a very high standard for a fertilizer. The second mixture figured from the same basis

would cost \$20.75, and would contain  $10\frac{1}{2}$  percent of phosphoric acid and  $12\frac{1}{2}$  percent of potash. Now, to compare this with the commercial ready mixed fertilizers will show loss of money in buying the ready mixed goods. The most popular brand on the market is the one-eight-four mixture, which contains 1 percent of ammonia, or 82-100 percent of nitrogen, 8 percent of phosphoric acid and 4 percent of potash, and sells for between \$22 and \$25. Now if the chemicals were bought and mixed to contain this percentage of constituents, the cost of a ton would come to \$13, figured from the cost of materials that I have given. Using this fertilizer, 300 pounds to an acre of corn, I have figured out the amount of plant food that goes in a hill of corn. In an acre there are about 4,500 hills and each hill would contain 1-125 of an ounce of nitrogen, 1-16 of an ounce of phosphoric acid and 1-32 of an ounce of potash, which is a ridiculous amount of plant food, and it shows why farmers fail to get results with this mixture, one-eight-four. In buying chemicals farmers should coöperate and save money. Feed the soil what it lacks, and it does not make much difference what crop is grown. The chemicals should be mixed by the farmer himself, and can be bought from most any fertilizer company.

Professor Cook also spent a few minutes talking about soil drainage, and was followed by Secretary Bachelder, who told the audience what the National Grange was doing. The other speakers of the evening, Professor Morse and H. O. Hadley, spoke on "Relation of the Experiment Station to the Farmer" and "Good Citizenship," respectively, which have already been reported. Harlan B. Barrett and the orchestra of the grange gave musical selections, which were enjoyed by the audience. Chairman Barker brought the institute to an end by thanking the farmers for their large attendance and the interest shown by the numerous questions asked the institute workers after each speech and between times.

## SURRY.

The next institute was held the following day, December 29, by the Board of Agriculture, upon the invitation of Surry Grange, at Surry, and, although the attendance was not so large, the community was well represented. County Member T. W. Barker was again the presiding officer. The invocation made by the Rev. M. W. Hale was followed by an address of welcome by H. F. Newell, master of Surry Grange, that brought a hearty response from the chairman. Professor Cook began the afternoon session with the subject,

## VENTILATION AND CONSTRUCTION OF STABLE.

Different views of the milk business and of hygiene will do away with the manure cellars common in this section, will result in construction of better barns, and then the manufacturing of milk will be carried on under as clean conditions as any cereal, placing the price of milk higher and in proportion to its food value. All these things depend on the light, the sanitary conditions, warmth of the stable or barn, and the ventilation. The amount of room for each cow in the stable should not be less than five hundred cubic feet and the height of the stable should be about nine feet. The square area of the windows should average between three and five square feet for each animal, depending on the thickness of the walls, and should be placed every fifteen feet. The stable should be free of all old-fashioned mangers and everything but necessary apparatus to which to fasten the cows. The walls should be constructed with studs from four to eight inches, and then boarded inside and out, and the space between filled with shavings, which are a nonconductor of heat. It is a physical impossibility to obtain a dead air space between the boards, because there are knot holes and the boards are not always matched. This arrangement keeps the moisture from getting in and will keep the heat from getting out.

I strongly recommend cement floors without any cellar, and in New York the law requires that every barn that is now being built must have them. The foundation for the floor should be solid and free from all dampness, and when these conditions have been attained lay cement, composed of what I have found to give good results, one part cement, four or five parts of sand, and six to eight parts of grout. If only one layer is to be laid, it should be laid to the depth of three inches, and should be given a rough finish to stop the cows from slipping on it.

It is a common practice in the state of New York, but rather expensive, to have tar paper and tar paint placed on the first layer of cement and then to coat the floor with more cement, one half to one inch thick, and it is laid in such a way as to form a fusion with the under coat. It is impossible to have a barn with a plank floor free from filth and dirt, and to prevent it from giving off odors, while a cement floor can be kept perfectly clean and the bedding will absorb the liquid manure. Every barn should have a system of flues, or, if they are too expensive, cotton windows. More trouble of garget and udder disease results from sudden drafts than from any other causes. In the outgoing flue the area should be in proportion to the number of cows, about one square foot to a cow, and should be opened at the top of the barn. Inside the barn the opening in summer should be up high and in the winter lower down. The incoming flues should have the same area, but there should be more of them, necessarily making them smaller. The air should come in from the outside near the sills, and into the barn from under the eaves. The flues should be built in the same way as the walls, and are the only method by which good ventilation can be obtained.

At this point Professor Morse lectured on

#### FEEDS FOR THE DAIRY.

In the past year all the foodstuffs on the market have been analyzed by us at the experiment station and were

found in the case of mixed feeds to contain just what was claimed by the companies, which was not the case a few weeks ago, with two exceptions. One mixed feed contained breweries grain, and the other kaffir corn. In buying these mixed feeds I would advise to buy in sacks that are marked, assuring reliability. The cottonseed meal on the market at the present time is good and has the right yellow color. The oil or gluten foodstuffs are not up to the standard, and care should be taken in buying them, and the same can be said of the distillers' grain. The dairy feeds are being made mostly from waste cereal products and some of them contain a lot of fine ground clover.

The class of feeds that are fast gaining popularity among the dairymen are the so-called molasses feeds, which are extremely palatable, and are made from screenings from cereals and well-cured corn stover soaked in molasses. We have also found in some a large amount of weed seed, which is the screening of the wheat of the West. These feeds, however, contain the amount of protein and fats that are guaranteed. The poultry feeds are fairly up to the standard, but contain some ground oat hulls. I do not favor the buying of any of the new class of mixed feeds, as they are not always what they are said to be, and in case of mixed feeds it is better to do the mixing yourself. Stick to the old reliable brands and let the others go by.

Professor Morse was followed by H. O. Hadley, who spoke on "How to Increase the Corn Crop" and "Bovine Tuberculosis and Prevention," saying that the latter subject depended on sanitary conditions and that an animal that always responds to the test should not necessarily be killed, but should be watched until the symptoms of the disease can be seen.

At the evening session before an increased gathering Professor Morse spoke on "The Relation of the Experiment Station to the Farmer," and Professor Cook treated the subject of



## SOIL DRAINAGE.

Lack of soil fertility, lack of resources for crops, lack of warmth in the soil, has been brought about by tillage and drainage only on the surface of the land instead of draining from below. Water should leave the soil from below and not evaporate or remain on the surface. Drainage of a field in a wet season makes the soil able to stand the severe test of a dry one. When water gets into the soil, air follows, and where air is, plant roots will soon be. In other words, under drains carry off the water, loosen up the plant food and organic matter and make the soil available for the rootlets of the plants.

The laying of tiles will give this result, and if you do not care to lay them systematically over the field, you can lay them in places where the water collects the most. Certain places should be tapped and the tile should follow the contours of the land, or the places that have the same level. To get the water out of a springy place, a sink basin should be built of stones and the tile should lead near the bottom. The ditch for the tile should be at least two feet deep, and it is a hard problem to dig them in New Hampshire on account of the rocky nature of the soil. In New York, under somewhat similar conditions, I have found a plow gave satisfaction constructed with the following dimensions: A plank board five and one half feet long, six inches at one end and nine inches at the other, two and one half inches thick, which has three steel diggers—fastened on the underside, two in the rear and one in front—two feet long, shaped like the flat edge of a pickax. The tiles should be laid perfectly level either by a water test or by a level. If they are laid this way, there is no danger of water remaining in the sags of the pipes, freezing and breaking them. The upper joints should be well made in order to prevent any sediment from getting in, and the outlets should be well protected for the same reason. If there is not a great fall in the land, the tile should be laid deeper at one end than the other.

There are three different kinds of tiles, and I prefer the vitrified, round, concrete sewer tile. The clay tile is no good because there are soft places in it and it is liable to break in the ground. In case tile is too expensive, I would advise the laying of stones, but they will not give satisfaction, and it is slow work placing them. The size of tile should not be less than three inches and should vary as to the amount of water that it is expected to carry. The tile should be laid on the ground except where the ground is covered with water, and then it is best to lay it on boards.

Mr. Hadley spent the rest of the evening on "Good Citizenship and the National Grange," which subjects have already been reported. Before the chairman's usual thanks to the farmers for the success of the institute, George E. Newman of Keene, a member of the grange, thanked the institute workers for their addresses and the farmers for interest that they have taken. The exercises of the evening were interspersed by selections by the grange choir, Sidney J. Wilder, Mrs. H. F. Newell, Mrs. G. O. Banks, and readings by Miss Ethel Britton and Miss Eva Randall. A fine supper was served in the hall following the afternoon session.

### LEMPSTER.

The next institute of the week was held the following day, Wednesday, December 20, at Lempster, on invitation of Silver Mountain Grange, and the institute speakers were accorded a good audience in spite of a snowstorm. The invocation made by the Rev. Arthur Nurie was followed by an address of welcome by Don S. Hooper, master of the grange, and it was responded to by the county member of the board, D. C. Westgate, who was the presiding officer. The opening address was delivered by Prof. B. S. Pickett of the New Hampshire experiment station on

### LOSSES IN POTATO GROWING.

When the average yield of potatoes in New Hampshire is about one hundred and twenty-four bushels to the acre it

can be readily seen that some farms are producing more and others less. The problems that present themselves in New Hampshire in potato growing are, first, to bring the average yield as near to the maximum as possible, and second, to increase the average by use of labor devices. The average yield can be made larger by preventing various leaks liable to happen in the following ways: Failure to select the most suitable varieties for our particular conditions of soil, climate or market; failure to select good seed of the variety which we wish to grow; poor methods of cultivation; failure to use proper fertilizers; poor marketing. The Green Mountain potato seems to be most popular and the potato best adapted to the soil of New Hampshire, but, nevertheless, at the experiment station, we have found two varieties grown on typical New Hampshire soil which are more productive than the Green Mountain, namely, the Delaware and Washington. It will be readily seen, however, that comparative plots placed side by side with different kinds of potatoes will test their merits and may possibly lead to the discovery of a variety especially adapted and fitted for the soil in different parts of the state. Not much needs to be said about the selection except that the seed potatoes should come from the hills that give the largest yields, are free from disease of any kind and suit one's ideal as to size, color, and general appearance. The tubers should be fully matured and free from disease. We will not say much about cultivation or the use of fertilizers only to indorse what Professor Cook has already said on that subject and to say that the farmers in New Hampshire are well versed in the way of raising potatoes.

The potatoes in this locality suffer from an insect and three different plant diseases, namely, the potato bug, early and late blight, and the potato scab. The potato bug can be killed by spraying with a mixture of arsenic of lead and Paris green. Arsenic of lead is a much more bulkier poison than Paris green, and while it takes more of it to do the work, it will cover a larger area of leaf surface and is absolutely

harmless to the foliage. Unless Paris green is perfectly good there is considerable danger of burning the leaves when applied at the rate of one half pound to fifty gallons of water. If two pounds of arsenic of lead and four ounces of Paris green be mixed together with fifty gallons of water, a poison strong enough to kill the adult beetles as soon as they appear in the spring will be made. It will stick better to the foliage than Paris green alone and there will be no danger whatever to the foliage. The early blight is not so dangerous as the late blight, and both can be forestalled by constant spraying, at least once a week, from the middle of July to the end of August, with Bordeaux mixture. Bordeaux mixture is composed of copper sulphate, lime, and water. To prepare fifty gallons of the mixture dissolve four pounds of copper sulphate in twenty-five gallons of water and do the same with the same amount of lime. Then pour the two mixtures through a strainer into a large barrel at the same time. For a small field a hand-spray pump mounted on a barrel will do good work, but for fields larger than five acres some of the geared horse-power sprayers will be found to be cheaper and more satisfactory. Potato scab is the result of planting in a field infected with the scab or planting scabby potatoes. This can be prevented by planting on clean land well treated with rotted stable manure and lime in other forms than slacked lime and ashes.

Professor Cook, Mr. Hadley and Secretary Bachelder spoke on "Dairy Feeding from a New Standpoint," "Thorough Cultivation of the Soil," and "A Profitable Crop," respectively, bringing the afternoon to a close. Between the afternoon and evening sessions a supper was served the speakers and the farmers from a distance by Silver Mountain Grange. The potato question was further discussed by Professor Pickett. Professor Cook lectured on "Fertilizers," Mr. Hadley on "Good Citizenship," and Secretary Bachelder on "The National Grange," all of which subjects have already been reported. The entertainment of the afternoon

and evening included recitations by Miss Sadie Quimby, Mrs. L. M. Wheeler, and songs by Miss Beatrice Walker and Don Hooper. Miss Ethel Pollard gave two piano selections. Chairman Westgate terminated the institute by voicing the thanks of the Board of Agriculture.

### GRANTHAM.

The last institute of the week was held Thursday, December 31, at Grantham, on invitation of Blue Mountain grange, and the speakers were driven ten miles from Newport, where they had spent the night. On arriving at Grantham they were given a cordial greeting and accorded a fine audience for the two sessions. County member of the board, D. C. Westgate, presided. The invocation made by the Rev. Frank Sawyer was followed by an appropriate address of welcome by Loyal Burton, master of the Blue Mountain Grange, to which Chairman Westgate responded. The first speaker was Professor Cook, and the chairman announced that his topic would be

### MOTHERHOOD OF THE DAIRY COW.

The raising of the calf is the cornerstone of the dairy business and should be given great care and thought. Many calves are immediately spoiled by overfeeding by having their digestive apparatus developed too fast. Ten pounds of milk a day is about the correct amount to start with, and then this should be increased gradually. There are few calves that are underfed. If skimmed milk is to be had it is an easy matter to feed the calf the best food. In New York there is a scarcity of skimmed milk, and I am accustomed to use third rate milk powder, and it costs about thirty cents for enough powder to prepare a hundred pounds of milk. Up to four months before the heifer freshens, the amount of feed should be steadily increased and should be governed by the appearance of the heifer. Three or four months before the heifer freshens there is generally a prejudice against



feeding enough, and this period in the heifer's life is the most important and the most developing. So the more food than ever should be given to develop her body, her offspring and her udder. Two weeks before the heifer freshens, take off the feed and look out for fever, which will surely come if rations are given that will produce milk. Udder diseases spring from fever, and fever and milk are rarely found together. The animal must be carefully studied at this time, as it is the most important period of her life. A clinical thermometer should be bought and used. If the temperature of the heifer is two degrees above normal, something is wrong,—presumably overfeeding. After the animal freshens, the feed should be taken off entirely for two weeks. It is a common practice to give the cow all she wants to eat at this period, but it is a mistake. If we put in feed to stimulate milk, inflammation of the udder and animal diseases occur. The cow should not have full rations until the calf is at least four weeks old, and then it is impossible to feed the cow too much of a balanced ration. The cow should then be given all she can digest and assimilate.

Miss Katherine Ide sang a solo and Miss Bernice Howe gave a reading. Professor Pickett and Mr. Hadley lectured on "Losses in Potato Growing" and "Cultivation of the Corn Crop," respectively. Several selections were given in the course of the afternoon by the grange orchestra, composed of eleven pieces. A bountiful supper was served by the ladies of Blue Mountain Grange. The evening session was opened by a selection by the orchestra, and then Professor Pickett told the audience

#### THE NEEDS OF NEW HAMPSHIRE FORESTRY.

The forests of New Hampshire are valuable for three reasons—first, for their own intrinsic value; second, for the preservation of manufacturing interests, and third, for the summer resort business. The needs of New Hampshire for-

estry include effective fire laws, equitable taxation, state forestry service, education on forestry, good sense, and wise management. The fire laws at present are very good, but do not regulate any methods of extinguishing and manner of redress if the guilty persons are found. The taxes are as high on timber land that is only harvested once in forty years as on lands from which a crop is grown yearly, and in many cases the assessment is made on the value of the land, while the farm cultivation land is not worth hardly anything. I think that legislation should be obtained for the assessment on timberland that would levy taxes on the amount of stumpage cut. A state forestry service would study for new uses to which the timber could be put, would give valuable advice in cutting and replanting, and would help to conserve the forest. I do not believe forestry should be taught in the public schools, because there are not enough men for college teaching, let alone public schools. But I do think that the teachers should try to make the scholars think favorably towards the trees. Good management includes the clearing away of all brush that will help towards starting a forest fire, cutting of the trees that are detrimental to the growth of the good ones, and leaving of some seed trees for reseedling.

The other talks of the evening included "Good Citizenship" and "The National Grange," by Mr. Hadley and Secretary Bachelder. The orchestra gave more selections, and Miss Katherine Ide and Mr. Ide rendered solos. The last institute for the year of 1908 was brought to a successful ending by the thanks of Chairman Westgate extended to the farmers and the grange for welcome given the speakers and the way that they had been entertained.

## INSTITUTES AT CONWAY AND WAKEFIELD

---

The State Board of Agriculture held farmers' institutes on February 16 and 17 in North Conway and Wakefield, on the invitation of the Pequawket and Lovell Union granges, respectively, of the two towns. The preliminary arrangements made by the secretary of the board met with an appropriate response in the unusually large and representative attendance. The speakers included Dr. George M. Twitchell, who was one of the speakers at the annual winter meeting of the Board of Agriculture, familiar to the farming people of New England. Prof. Frederick W. Taylor, agriculturist at the State College, and H. O. Hadley, master of the State Grange.

The topics for the occasion were especially adapted to the local conditions, and Dr. Twitchell, with his subjects, "Where Are the Dollars" and a "Live Message to Every Man," aroused more than the ordinary interest, and several of his listeners at the close of the meeting congratulated him and said that speeches of this kind had been wanted for some time in the community. Members of other granges who were present intend to have his services in the near future.

### NORTH CONWAY.

The first meeting of the week was held Tuesday, February 16, at North Conway, in the shadow of the White Mountains. The invocation was made by the Rev. Bruce Brothertone. An address of welcome fitting the time was given by George V. Eastman in behalf of the master of the town grange, who was held to his home on account of illness. The presiding officer, H. O. Hadley, responded for the board

to the cordial welcome extended on the part of the citizens of North Conway and the members of the grange. Mr. Hadley outlined the history of this organization and its duty and present work.

The first speaker of the afternoon was Prof. F. W. Taylor of the State College, and his subject was

#### GRAIN GROWING IN NEW HAMPSHIRE.

Some fifty years ago the grain grown in the state of New Hampshire amounted to over one and one half million bushels, but in the last fifty years this output has shrunk to one million, a decrease of 33 1-3 percent, due to the cheap price of western grains and the degeneration of the New Hampshire farmer. In the last few years the price per bushel of corn has reached ninety cents, and I do not see how the farmer of this state can afford to buy at such a price. I think that the day of cheap corn is past because of the increasing population, and as the supply will be insufficient to meet the demand, the price of corn will steadily rise. With the increased production of live stock, the greater demand for meals and, indirectly, beefsteak, we have seen the last of fifty cents per bushel for corn.

Can it be grown in New Hampshire? Yes; it used to be grown and we can grow it again. Can we afford to grow it? Yes; it can be produced for thirty-five to forty cents per bushel, and I don't see how the farmer can afford to buy it at the advanced price. The farmers have had too easy access to the country store.

Now as to the varieties to grow. Do not depend on Boston seedsmen for your seed, as I have found at the college by experiment that their seeds bearing fancy names, suggesting their early qualities, were the latest to mature, but have corn for seed that has been grown in the neighborhood for at least ten years and has become acclimated to the existing conditions. Buy from someone in the neighborhood who has been careful in selecting and storing.

The speaker's next subtopic under corn growing was the testing of the seed, and he earnestly recommended that the germination test be applied and he reasoned that if one kernel in ten from each ear failed to germinate, the vitality of the ear was not sufficient for planting and the kernels should not be planted.

The preparation of the seed bed is an important factor in successful growing, and should be thorough. Sod land, above all other kinds, is most fitted for a seed bed, and should be plowed the previous fall, giving the weather a chance to wear on the land and to weather it, producing a mellowing effect. Professor Taylor spoke in favor of continual harrowing, not a new subject in agriculture.

The decrease in the yield of oats Professor Taylor attributed to many reasons. Again, western grains have been the cause of another New Hampshire decrease. In a minor way the lack of threshing outfits has helped, but there used to be threshing outfits. We have seen the last of cheap oats. There is perhaps a trifle more difficulty in growing oats than corn, on account of rust. Rust is dangerous, but by judicious selection of varieties known to be exempt from this disease it can be avoided. Smut is another sore, but that can be destroyed by soaking in hot water or in a weak solution formula. Professor Taylor also discussed the question of

#### COMMERCIAL FERTILIZERS VS. CHEMICALS.

He confined his talk to a chart where different labeled goods of one firm bearing their mark of percentage composition were compared in price to a chemical mixed fertilizer containing the same percentages.

In the introduction Professor Taylor said: "Many people in the last few months have written to me inquiring where they could get the best fertilizers for their crops, and inquiring whether there was any difference in quality and price of fertilizers bought mixed from the companies and the price of the chemicals required for the fertilizers. I



have prepared the following chart, which contains different kinds and the percentage composition and chemicals, giving the same composition and their relative prices:

"Potato manure: Nitrogen, 1.75 percent; phosphoric acid, 9 percent; potash, 5.5 percent; cost, \$30.

"Chemicals: Seven hundred pounds tankage at \$27, \$9.45; 500 acid phosphate at \$14, \$3.50; 220 muriate potash at \$42, \$4.62; cost, \$17.57.

"Difference in price, \$12.43.

"Grass and grain: Nitrogen, 2.2 percent; phosphoric acid, 16.5 percent; potash, 12.5 percent; cost, \$46.

"Chemicals: Fifteen thousand pounds boneblack at \$25, \$18.75; 500 pounds muriate potash at \$42, \$10.50; cost, \$29.25.

"Difference in price, \$16.75.

"Corn and general crops: Nitrogen, 2.5 percent; phosphoric acid, 8.5 percent; potash, 8 percent; cost, \$40.

"Chemicals: One thousand pounds boneblack at \$20, \$10; 300 nitrate of soda at \$50, \$7.50; 100 tankage at \$27, \$1.35; 325 muriate potash at \$42, \$6.82; cost, \$24.67.

"Difference in price, \$15.33.

"What is the meaning of this? It looks as if the fertilizer people were charging us well for their goods. This gives you some idea of the profit they are making and charging you for mixing. We expect them to get fair prices, but why should we pay this big difference when we might have it for ourselves by sending to the companies and buying the raw material in form of chemicals and mixing it ourselves."

Dr. Twitchell was the next speaker on the program and his subject was

#### POTATOES A CASH CROP EVERY YEAR.

Potatoes are a cash crop wherever they can be grown, and New England is especially adapted, both in climate and soil, to the production of potatoes. Wherever a furrow can be turned at least twenty rods in length, the cost per bushel

can be made as low as twenty cents. The selection of land for a field is the first step. I prefer a pasture or sod land that has been in growth for a number of years, instead of land that has been previously worked.

There are many varieties of seed, the best, taking under consideration the favorite in the market and the local conditions, being a matter of opinion, but nevertheless the bulkier type is preferable to the long and slender. The Green Mountain, a popular potato, has a tendency to revert to this slender type. The cutting should furnish a thick-set piece for planting.

Proceeding, the speaker outlined the different methods of plowing, cultivating, and fertilizing, all interesting and complete in detail, but for the most part over well-worn ground.

There was considerable laughter when the doctor said: "The potato bug is the best friend that the potato grower ever had. He is the only thing that makes the man look after his crop and do considerable spraying. A high-pressured, horse-powered machine is necessary, and, with a four-row sprayer, an acre an hour is the average accomplishment." Following the spraying with the Bordeaux mixture and the insecticide to kill the potato slugs, the speaker explained that it was equally necessary to spray for blight.

Out of wealth of data and a storehouse of personal experience, Dr. Twitchell gave conclusive evidence that it was best to spray about five times in the season, every ten to fifteen days, to insure a productive crop. It will not do to do it only once or twice, and as the blight has not come give it up entirely, as it comes when least expected, and so the only safeguard is in continual spraying.

A machine digger is applicable to the fields of Maine, where there is a notable absence of large rocks, but it is questionable in New England generally, for the machine is liable to be left a total wreck, after running against an immovable boulder.

Dr. Twitchell preferred crates, because their use was more

expedient than the use of bags, and it took less time to place the tubers in them, cart them from the field and ship them away.

Concluding he said: "The condition of the field after the crop has been taken off is better for the seeding of grass than if the original field had been plowed and worked in preparation for seeding to grass. Potato growing is one of the best systems of rotating land to retain its fertility, and should be looked at from the standpoint of today, and not that of yesterday."

Discussions at the end of this speech showed that there was a diversity of opinion on the advisability of hilling potatoes instead of carrying on level cultivation. Various photographs, the property of Dr. Twitchell, showed the different stages in the growth and the care of the potato plant.

The last speaker of the afternoon was the master of the State Grange, H. O. Hadley, and his subject was "Good Citizenship," which he discussed in its various phases in a much similar manner as at previous institutes, and at times brought applause for his clear, vigorous statements. Between the afternoon and evening sessions a fine grange supper was served to the institute speakers and those who had come from a distance in the grange hall by Pequawket Grange, under the direction of Mrs. J. E. Tibbetts, E. White-more, and J. L. Pendexter.

The evening session was enlivened by the introduction of musical selections by the grange choir and readings by Mrs. Helen Averill, V. Tibbetts, and an excellent recitation by Miss Mabel Davis. The evening was begun by Professor Taylor with "The Relation of the Experiment Station to the Farmer," and he treated it in much the same way as did Prof. Fred Rasmussen and Prof. B. S. Pickett, also of the State College, whose speeches have already appeared in part in print. Dr. Twitchell followed with "A Live Message for Every Man," which will be given in part in the report of the following institute at Wakefield. The session was brought

to a close by Mr. Hadley with an effective combination of the subjects, "Thorough Cultivation of the Soil" and "The National Grange," leaving a good impression in the minds of the audience of this one-day institute, which was one of the most successful of its kind ever held in the country.

### WAKEFIELD.

The next institute was held the following day at Wakefield, Wednesday, February 17, and, although there had been a heavy snowstorm the night previous, the attendance was up to the mark, and what was lacking in attendance was made up by the increased spirit of the meeting. An invocation was made by the Rev. O. G. Baker. H. H. Trufant, principal of the grammar school at Sanbornville, in his welcoming address said:

"Mr. Chairman, the members of the State Board of Agriculture, and those connected with it:—It gives great pleasure today to extend to you in behalf of the members of Lovell Union Grange and the citizens of the town of Wakefield a hearty welcome. We welcome you to our town for the first time, a town of which we are justly proud—proud of her broad and fertile fields, her beautiful scenery and natural resources. I trust that your efforts here today will be crowned with success and create an awakening among the farmers of this town that will spur them on to renewed efforts to make their calling more honorable and more lucrative."

To this cordial and eloquent address of welcome, Mr. Hadley responded for the Board of Agriculture. The rest of the afternoon exercises were carried on with Mr. Trufant as the presiding officer. Dr. Twitchell spoke on

### WHERE ARE THE DOLLARS?

Inevitably the spirit of commercialism dominates human life because of the increasing necessities confronting the tiller of the soil. "Where are the dollars?" is the question

every man is seeking to solve. Why so many failures? If this mercenary spirit dominates to such a degree it will nevertheless remain at the foundation of all successes and must be considered the controlling factor. I want for a little to divorce the orchard from the other lines of farm work and consider it as a possible branch worthy the application of that business skill and ability given so freely to the carrying forward of other lines of industry.

The speaker said that the apple trees yield more in New England than they do elsewhere. Before the growing of apples\* can become an industry some simple rules must be vigorously applied. First, the man must have a love for the tree and a desire to coöperate with it by making its environments congenial. The selection of a location for an orchard is vital. Fortunately, New England hillside farms are wonderfully adapted to fruit growing, the rock structure and the mineral deposits being of such nature as to insure quality not possible in other soils and foundations.

Second, next to the man must be placed the varieties, selected with sole reference to the soil location and the market. Two varieties for a market crop should be the limit, and this latitude is only to be recognized to provide against failure. At this point the speaker mentioned the different kinds of apples, including Ben Davis, McIntosh Red, Spy, Wolfe River, and Baldwin, but said: "This subject of varieties is largely one of individual tastes and adaptability to location, than otherwise, and the man who selects any one of these standards will not want a market. As with everything else, the production must be in such quantity as to attract the attention of the buyers. Here is the objection to the practice so common of setting a few of the many sorts. The man with five hundred barrels of any known variety will invite purchasers, while another with the same number divided among ten varieties will pass unnoticed."

Dr. Twitchell warned his listeners about buying cheap trees. He called for one inch, five-foot trees, guaranteed to name, and not only thoroughly inspected but fumigated



before shipment. The price for good material is above eight or ten cents. Reliable nurserymen are the only ones to be depended on.

The man who is exacting in the setting of his trees will be exacting also in the preparation of his land and the setting of his young trees. Thorough and deep plowing, intense cultivation and liberal fertilizing alone can put the soil in condition. It is the one place that requires thoroughness not alone in the lining of the roots but in giving the roots the best possible chance of getting nourishment. No man can hope for dollars who robs his growing crop of the grass underneath. One crop at the time must be the motto. The trouble is that too many orchards persist in turning out a fair crop, when a little attention paid to pruning would have brought them up to the standard. Excessive pruning is dangerous, but frequent visits with the saw and knife will benefit both wood and fruit. The relation between the wood and fruit must be kept constant and the pruning is accordingly based on this principle.

Of the spraying much might be said. A standard sprayer should be well built, of ample power, and completely adjustable. The damaged fruit in many orchards, not sprayed, would pay all expenses of care and fertilization, leaving the picked fruit a net profit. Two thorough sprayings will practically clear an orchard of wormy fruit, except those infected with the railroad worm. Either hogs or sheep must be utilized in keeping the ground free of the fallen fruit and to prevent the apples of next year from becoming railroaded. As the tree comes into bearing cull the inferior and imperfect specimens, long before picking time, to insure a better growth and quality and also to relieve the tree of its overburden.

Here the speaker spent considerable time in speaking of the intrinsic value of the trees and the money in them when not neglected. He next turned his attention to dishonest packing, which he declared had given western competition a chance and has driven New England apples from

the Boston and New York markets, notwithstanding that they are superior in quality, but far behind in uniformity and appearance. To prove his assertion that there are dollars in apples, Dr. Twitchell gave specific examples of men in different states in New England and the money they had invested in this fruit growing, yielding them a tremendous profit. Their splendid results were conclusive evidence in favor of the speaker.

Concluding, he said: "Here are the dollars, not in setting trees and leaving them to fight the battle of life unaided, but in making the growing of fruit an industry worthy of the best thought, deepest research, and the greatest skill of the owner. Until we approach the business from this side, we must stand being jostled more and more by the western producers and stand on our own markets, seeing buyers select inferior quality but larger, smoother, more uniform, and better-looking fruit than we put up for sale."

Professor F. R. Taylor again spoke on "Grain Growing in New Hampshire," and he held the attention of the audience. H. O. Hadley closed the speaking of the afternoon with "Good Citizenship" and "National Grange," drawing applause for the clever wording of his thoughts. Between the sessions a fine supper was served the institute workers and those who had come from a distance to attend, by the Lovell Union Grange, under the personal charge of J. E. Lang, Edward Wheeler, Rose Roberts, Almond Weeks, and Mrs. Huntress.

Professor Taylor opened the following session with the subject, "The Relation of the Experiment Station to the Farmer." He was followed by Dr. Twitchell with the topic, a lively one,

#### A LIVE MESSAGE FOR EVERY MAN.

In the last few months I visited a reunion of the alumni of an old academy, and men of many professions were gathered there. One thing they agreed upon. The practice of medi-

cine, law, mechanics, religion, commerce, and agriculture, especially, has been revolutionized in the last twenty-five years. Unless we are conscious of this change, the message is going to amount to nothing. The standpoint of today is not that of yesterday.

Continuing along this same line of thought, the speaker finally brought his introduction to a close by these words: "Prepare to let go methods, not principles. Do not seek for results, but for more results."

My first message is agriculture, which is the foundation stone of the industries of the world, and which, if it does not strive, prevents everything else from striving. Think, we are only six months from starvation, which is alone prevented by the tiller of the soil. We need a sharper study of the problem, a breaking away from the old well-worn system of half a crop. A half a crop spells failure. The farmer must know. We are in touch with forces that you have not yet fathomed; and to develop these to their fullest and roundest possibility the farmer must increase and add to his small store of knowledge.

My second message is education—a vital problem for humanity, requiring the hardest thought and the deepest research. Is it a course through the preparatory schools and colleges? No; it is not the learning that a man can quote from books, but what he knows that will earn him a living. Through books and not from books should be the motto. The training of the boy should be at home. The door through the combination capital on one hand and labor on the other, through the introduction of labor-saving machines, has closed the chance for a boy to learn a trade. Does a school fit a boy for industrial life? If we all had an equal chance, there would be no need of asking this question. We are training heads but are neglecting hands and feet.

My third message is self-control and self-constraint, temperance. The speaker came out with the startling statement that attractively done up vials, containing two or three ounces of liquor, were being sent through the mail to the

young boys throughout the country, as a result of a decision by western liquor dealers that their future business depends on the growing generation. Their policy is to create an appetite. Coupled to this, Dr. Twitchell said that he had been informed that teachers of the fourth and fifth grades had received letters from western people asking for the names of their scholars. "Whether there are any connections to these two facts I do not know," said Dr. Twitchell, "but this fact I am sure of—the children are getting liquor. We are dormant and inactive, and there should be that quickening of the public pulse that should rise up and cry out against such proceedings."

The speaker's next three points included the country or patriotism, the church and the grange, and he spoke on them in a liberal manner, leaving the impression on the minds of the audience that the people of the country were not living up to the principle of their forefathers when coming in contact with these three vital questions.

Competent to discuss these points to their fullest extent, on account of many years of observation and personal experience, Dr. Twitchell tuned the feelings of the audience to the highest pitch through his forcible and lucid statements, and a vigorous handclapping greeted his closing remarks.

Any possible monotony of the afternoon and evening sessions was forestalled by the giving of readings, recitations, and musical selections. There were songs by the grange choir, a cornet solo by Henry Willy, Jr., a reading by Miss Grace Yeaton, and a song by a quartet.

## INSTITUTES AT LYNDEBOROUGH AND MERRIMACK.

---

The State Board of Agriculture held the last two farmers' institutes for the year of 1909 at Lyndeborough Center, December 28, and at Merrimack, December 29. Despite the heavy and difficult traveling on account of the unprecedented snowstorm, the institute was well attended. For the closing year the work done by the Board of Agriculture has been unusually successful. The first meeting of the week was held at Lyndeborough Center, upon invitation of Pinnacle grange. Two sessions were given, one in the afternoon and the other in the evening. The speakers for the occasion were men of special training, and were adapted to speak on the promotion of agriculture in the state of New Hampshire. They included Prof. John C. McNutt, professor of animal husbandry at the New Hampshire State College; Prof. L. A. Clinton, who has charge of the experiment station at Storrs, Conn.; H. O. Hadley of Peterborough, county member of the State Board of Agriculture, and Charles E. Hardy of Hollis.

### LYNDEBOROUGH.

At Lyndeborough the session was promptly called to order at 2 o'clock by Chairman Hadley. Invocation was made by the Rev. George F. Bradford, and a cordial address of welcome was given to the institute workers by Arthur E. Woodward, master of the grange. Chairman Hadley responded.

The first address of the afternoon was delivered by Charles E. Hardy of Hollis, whose phenomenal success in growing



apples during the last year has made him a reliable authority on the subject on which he was to speak, "Care of the Apple Orchard." Competing with the best apple growers in New England at the New England horticulture show in Boston, Mr. Hardy won nine prizes, including the Governor Draper cup for the best exhibit of Baldwin apples, on nine exhibits of Baldwin and McIntosh apples. Later, at an exhibition at Cornell university, where there were exhibits from all over the western states, he secured second place on a plate of Baldwin apples. Mr. Hardy was also successful at the New Hampshire Horticulture show, which was recently held in Peterborough. In speaking of the

#### CARE OF THE APPLE ORCHARD,

he related his experiences as an apple grower for three years, saying in part:

. My experience in apple growing has been with old trees bearing Baldwin and McIntosh apples, and not with the growth and care of new trees.

He lived at his present home until twenty years ago, at which time he left the farm and had gone into other business. Three years ago he returned to the farm in Hollis and commenced growing apples.

In my first year from my old orchard of six hundred and fifty trees I picked four hundred and fifty barrels of apples, but they were poor in quality. Most of them were scaly, and at that time I did not know with what disease they were infected. Later on, corresponding with the State College, through my son, I found that the apples had the San Jose scale. Many of the trees were dead and were filled with brush. I was discouraged and thought I would go out of the business. I did not, however.

Mr. Hardy said that he had trimmed some trees that winter and had sprayed them in the spring with scalicide and Bordeaux mixture, using only two barrels of the latter and a hand pump as power for the sprayer. He has two orchards: the north, which contains two hundred trees, and the south,

which has four hundred trees. He only sprayed those in the latter orchard.

That fall I harvested six hundred barrels of apples from the four hundred trees which I had sprayed in the south orchard, and only one hundred barrels from the two hundred trees in the north orchard, besides one hundred and thirty-five barrels from the scattered trees. The apples which had come from the south orchard, which, you remember, I said that I sprayed, were far better in quality than those apples which had been picked in the other orchard. They were larger and more uniform in size, free to a greater extent from scales and had a better color. This set me to thinking, and I decided if spraying made a difference in my output of apples it was worth while. This was in 1907.

Mr. Hardy then bought a power sprayer and used it on his trees with a mixture of sulphur and lime, in December and March. He also related that he had trimmed the brush from the middle of the trees, even tapering the branches to the ends. He preserved the shape of the tree. Two weeks after the blossoms had fallen he sprayed with three pounds of arsenic of lead to fifty gallons of water, and said that he had no trouble from the brown-tail moth.

In 1907 I picked eight hundred and thirty-five barrels, of which number one hundred and eleven were scaly; in 1908 I harvested one thousand one hundred and fifty barrels, of which fifty were marked with scales; in 1909 I picked one thousand barrels, and only nineteen barrels were infected with the San Jose scale. Besides spraying I also fertilized the trees. In 1907 I plowed the north orchard and sowed it with oats, which I later plowed under. I used commercial fertilizer. The next year I bought some ground bone and used stable manure, and this year had nine tons of potash, four tons of ground bone, and one ton of nitrate of soda. Most of the south orchard was in grass, and I have kept it in grass and clover. In this orchard there are two hundred young trees in ground which has not been plowed for seven years. These trees yielded me the best and the largest num-

ber of apples. Twenty to twenty-five props were needed for each tree.

In packing apples Mr. Hardy said that he packed each apple separately in paper in air-tight barrels and boxes. The barrels containing the best apples were marked with his name and all barrels are stamped with the grade. Apple growing has been especially remunerative for Mr. Hardy. In 1907 he received \$2,400; in 1908, \$2,500; in 1909 his total amount will be close to \$3,500. In three years he had received over \$8,000 from his apple orchard, by spraying, fertilizing, and keeping the ground free from fallen apples.

Mr. Hardy was followed by Professor Clinton, who spoke on

#### MAINTAINING SOIL FERTILITY.

This question of soil fertility applies to the management of the soil, to the holding of the richness or the humus in the ground in its proper place. It is a matter of soil condition. In this state there are many so-called abandoned farms, but it is not the farms which are abandoned, but the buildings. The best farms are run down. The fault lies with the men and not with the farms. It is run-down men, because the fertility is there, waiting for man to get it out and by intensive methods of cultivation procure a good living.

Professor Clinton remarked that the best seed will fail under unfavorable soil conditions, and that the favorable condition of the soil, which is full of life, active with organisms, teeming with life called bacteria, depends on ventilation, underdrainage, winter planting, cultivation and fertilizing. The soil needs ventilation as much as a dairy barn. Cows need it and human beings need it in their sleeping rooms. Fresh air is as much needed for the soil as for anything else, and without plenty of air the soil will not support plant life. A plant has as much chance of living in a hard, compact soil which has never been cultivated or turned to the atmosphere, as men have of living in a poorly ventilated room.

Professor Clinton asked how many farmers sowed any crop on field from which they had harvested a crop of corn or potatoes. He received no answer. He said that their system was wrong. Every acre should go into the winter with some crop, and rye should be grown, especially on the hill-sides. It is one of the most suitable plants for winter growth. The professor explained how it held the humus in the ground, how it kept the soluble nitrates in the soil and prevented surface erosion. The exception to this winter planting, he said, was a case when the soil was a heavy clay type or contained witch grass. In this instance it should be plowed in the late fall and be well harrowed in the spring. In case when rye is planted, it should be turned under early in the spring when the soil is moist, so that the moisture will decay the rye.

Professor Clinton recommended a system of underdrainage. He spoke of several examples of fields, which were low and water-logged in one corner, and for that reason were useless for planting. If an underdrain was laid it would change a worthless piece of ground into one very suitable for extensive cultivation. But every farm requires a study of local conditions. The best directions to follow, however, are those by which you make a flower bed in spring. The fulfillment of these directions renders ideal soil fertility. The soil in the fields, like that in the flower garden, should be plowed deeply, well fertilized, ventilated, and drained.

This address closed the afternoon session. Between the addresses the farmers asked several pertinent questions, which were answered to their great satisfaction by the speakers. The exercises were interspersed by musical selections by the grange orchestra and choir. Master Harold Freeman and George Warren rendered solos which met with applause. The grange provided a farmers' supper between the afternoon and evening sessions for the institute workers and for those attending from distant parts of the town and other parts of the county.

The evening session was opened by a piano solo by Mrs. Charles Terrill, who was followed by Professor McNutt, who spoke on the

#### FEEDING OF DAIRY CATTLE.

In 1909 there were sixteen thousand cattle in this state, as compared to one hundred and twenty-nine thousand at the present time. There is more feed brought into the state now for each head of cattle than there was fifteen years ago. There is not so much grain as there should be and not nearly so much as has been grown in former years. In fifteen years the advance in grain has been nearly 50 percent, while the advance in dairy products has only been 14 or 15 percent. For this reason the dairy industry as a means of livelihood is a more serious proposition than it was years ago. It is not so prosperous in this state as in others and in previous years. To be successful, a man must study and must be thoroughly conversant with this business.

Professor McNutt laid the unhappy outlook in the state to poor cows and the advance in feed. He said that the cows could be improved by introducing pure-bred cattle, bred from high record bulls and dams. "Poor cattle," he said, "is hurting things in this state, and, together with the high cost of feed, is a serious proposition." Many farmers, Professor McNutt explained, are making a mistake by feeding a balanced ration, because that kind of feed will not meet the demands of the cow, whose lactation is not constant, but which varies. Instead he recommended the narrow and wide ration, which he said meant the excess of nitrogenous food, as in the former case, and the excess of carbohydrates, as in the latter case. With this kind of ration, the demands and the wants of a cow may be met. One food, or the wide ration, gives the cow bodily strength, and the other, or narrow ration, produces milk.

There are many kinds of feeds adaptable for dairy feeding, but I recommended those leguminous plants which can be grown on the farm, containing a large amount of proteids.



In this state the milk returns hardly pay the feed bills, and the reason for that is that the farmers are importing too much grain from other states which they may grow, or its equivalent, on their own farms at smaller cost. Professor McNutt recommended that corn, peas, clover, and alfalfa be grown in greater quantities on the farm, that corn silage be used in cutting down the cost of feed in the dairy business. With a small chart which he had made, on which was one of the few rations which are ideal for New Hampshire farmers, the professor explained the amount of dry matter, nitrogenous food, carbohydrates, and fat food which each constituent contained, and the purpose of each. It consisted of clover hay, corn silage, wheat bran, corn meal, cotton seed, and gluten feed. Clover hay and corn silage were in the greater proportion, and were the feeds which could be raised on every farm in New Hampshire during the past year, and which would make dairying pay. The nitrogenous ratio was 1 to 5.3.

Professor Clinton was the next speaker on the program, and this time his subject was

#### MODERN METHODS OF POTATO CULTURE.

As good potatoes as were ever raised in Maine or any other state may be raised in New Hampshire if care, painstaking care, be employed in selecting a seed bed, in planting, cultivating, and general growing. These are the essentials in the modern methods of potato culture, and the faithful following of these up-to-date methods will make potato growing a successful industry in New Hampshire. The seed should have light land for a seed bed, which should be open and loose in texture, and not have a hard, compact soil. The best hay land or the best corn land is not necessarily the best potato land. Pasture land on which corn has been grown for a year makes ideal land for the planting of this crop, because the sod has been decomposed and changed into humus. Stable manure should be placed on the winter before and plowed

under early in the spring. Next is the question of seed potato. Seed which has been cared for in the winter is the seed which is desired. There is no difference between Vermont, Maine, and New Hampshire seed, if it has been properly cared for. Select the seed which will produce that type of potato which you most desire to have for your product. It is not wise or right to select the largest or the smallest, but do select the medium size.

Professor Clinton said that he had always found twelve bushels of potatoes enough for one acre, and he advised the selection of seed from every hill which had six perfect tubers when the crop is dug. To prevent scab, he said, the seed should be treated with a solution of formaldehyde. A potato should be cut into four or five chunky pieces, which have at least one eye. The small, chunky piece, with its smaller cut surface, is better than the long, thin piece for two reasons: it will give the seed more food to start on and it will heal its smaller wounded surface quicker. In planting potatoes on more than five acres Professor Clinton advised the farmers to get a potato planter, and he caused much laughter when he told them that whoever buys a machine would immediately notify his neighbors that he will plant their potatoes for a small consideration and in this way prevent the continual borrowing and lending of his new potato planter.

Potatoes should be planted as soon as they are cut, and in rows which are about three feet apart. The potatoes should be fourteen inches apart in the rows. The rows should be plowed with a double mold plow, and after the seed has distributed the rows may be covered by running the plow between the original furrows. This method leaves a ridge above the seed bed, which is now covered by eight inches of soil. As soon as the weeds have started, the ridge should be leveled with a smoothing harrow. The field should be gone over with a spike-tooth harrow three or four times before the plant appears, and the field should be left as level as a floor. This cultivation and this level should be continued until it is impossible to move with horse and harrow with-

out damaging the plants. The cultivation abolishes all hoeing and kills the weeds.

For fertilizer, Professor Clinton said that he had always found it cheaper to buy the chemicals and mix them himself. On an acre of land he used 250 pounds of nitrate of soda, 250 pounds of acid phosphate, and 150 pounds of muriate of potash. He recommended the fertilizer be thrown broadcast and not placed in the rows. As a preventive against blight, he advised a solution consisting of two pounds of arsenic of lead, five pounds of Bordeaux mixture, in fifty gallons of water. This is enough spraying for one acre.

The closing address of the evening was delivered by H. O. Hadley, who spoke on

#### THOROUGH CULTIVATION.

The lacking of the fertility in the soil is fortunate, because the farmers acquire character in reaching it. To raise good crops one must thoroughly prepare the soil. The modern methods of today are different and would seem odd and unnecessary to our ancestors. Mr. Hadley said that when his father used to plow a field it made no difference to him if the plow occasionally came out; that he used to harrow the field once or twice across and then consider it a fit seed bed. He said that things are changed and that every bit of the soil must be harrowed until it is thoroughly prepared. The speaker then changed his thought from the thorough cultivation of the soil to the thorough cultivation of the mind in the grange. The grange in some parts of the state is drifting away from its real purpose. Too much time is devoted to social life, and too little to the discussion of topics in the grange meetings, allied to the promotion of agriculture. The grange should give this promotion of agriculture first place and should thoroughly cultivate their minds on agricultural subjects. All other things should be secondary.

The evening session was interspersed with musical selections by the grange orchestra. That night the institute workers remained in neighboring farmhouses and proceeded the next day to Merrimack by the way of Nashua.

### MERRIMACK.

The farmers' institute at Merrimack, on Wednesday, December 29, was held on invitation of Thornton Grange, and the attendance of farmers from Merrimack and the surrounding towns was extremely pleasing to the members of the board. After the invocation had been made by George P. Foscett, and an address of welcome given by Frank R. Corning, master of the grange, Professor McNutt addressed the farmers on

#### LIVE STOCK MANAGEMENT.

His address was based on a comparison of livestock management in Ohio, where he was situated before coming to New Hampshire, and that industry in this state. He said: "The people in New Hampshire are paying too much for western horses. They are not raising enough horses under favorable conditions. People can raise and make business profitable by importing and breeding better horses. They must raise their own feed and stop buying western grain."

Speaking of raising sheep, he said: "The sheep industry in the state, possessing some pastures good for nothing else, is decreasing instead of increasing. The state laws protect the dogs and not the sheep, and poor dog laws have been one of the reasons for the decrease in this industry. Pure bred sheep should be introduced and should displace the scrub sheep. There is an easy, accessible market for early Christmas and Easter lambs. The best spring lambs which were grown at the New Hampshire State College last spring came from a cross between a Merino and a Southdown."

Concerning hogs he said: "There is no money in hogs if they are fed one dollar and fifty cent corn. Problem may be

solved if green crops are raised for feed. Grow better hogs and then grow them better. Experiments with hogs poor in blood, from the south, performed by the Wisconsin experiment station, showed that hogs can be improved by breeding."

Professor McNutt, when speaking about the dairy industry, said the average output of a cow in New Hampshire should be six thousand pounds of milk instead of four thousand pounds. Records should be kept of each cow. Cattle may be improved by better stock, better breeding, better selection, and better feeding. Better business methods, better stock and better feeding will not only improve the dairy business, but also the other live stock industries.

The other speakers of the sessions were those who spoke yesterday and who addressed the farmers on the same subjects. Between the sessions, a supper was served by the grange. The exercises were relieved of any possible monotony by a solo by Mrs. L. Jones, a reading by Miss Mabel Judkins and Miles Cochrane. There were also musical selections by the grange choir.



## INSTITUTES AT EAST SULLIVAN, WEST CHESTERFIELD AND CORNISH FLAT.

---

### EAST SULLIVAN.

The New Hampshire State Board of Agriculture held farmers' institutes in Cheshire county, February 1, at East Sullivan, upon invitation of Honor Bright Grange, and at West Chesterfield, February 2, upon invitation of Spafford grange. At the first institute the invocation was by Winfred J. White and the address of welcome by T. W. Barker of Munsonville, county member. The first address was by Prof. F. W. Taylor of Durham, upon "Selection and Breeding of Corn." Lottie I. Field gave an interesting reading, after which the Hon. H. O. Hadley of Peterborough, member of the board, gave an address upon "Potato Growing for Profit." A song was rendered by Grace M. and Wilfred R. Wilder, after which Dr. George M. Twitchell of Auburn, Me., delivered an address upon "The Cry of the Orchard."

A bountiful supper was served by members of Honor Bright Grange, and a social hour enjoyed. At the evening session Professor Taylor spoke upon "Fertilizers—Their Use and Value," which was followed by a reading by Grace M. Barber. Dr. Twitchell delivered an address upon "A Practical Education for Every Child," after which Blanche L. Hastings gave a delightful musical selection. Mr. Hadley spoke upon "Thorough Cultivation," and Secretary Bachelder talked about the development of rural New Hampshire. It was a well-attended and successful institute.

## WEST CHESTERFIELD.

The institute upon the following day was held at West Chesterfield, upon invitation of Spafford grange. After the invocation by the chaplain of the grange an address of welcome was delivered by Master Richardson, to which County Member Barker responded. After a song by the grange chorus, Professor Taylor spoke upon "Selection and Breeding of Corn." Mrs. Smith gave a song, followed by L. B. Harris of Lyndonville, Vt., upon "Keeping Sheep for Profit," who spoke as follows:

## SHEEP BREEDING FOR PROFIT.

I deem it of considerable importance to the sheep men, and to the commonwealth, that your citizens engaged in the sheep-breeding industry have got together and formed a state society to forward their interests.

Whether this society is of lasting good depends entirely on its management—societies rise and fall as they are managed. Your field, your opportunity, is vast; no similar body of men ever had a better chance to succeed. Let me urge you to push ahead with all your might. But let me warn you to go slow. Perhaps the greatest danger that is likely to come to you will be that under some excitement or excess of zeal you will induce someone to go into the sheep business who knows nothing of it, and who has no natural ability to take care of sheep. You will do well to keep constantly in mind that it takes more skill and less labor to take care of sheep than of any other live stock. You may lay down rules for their care, and you should,—rigid rules,—but if you do not possess the skill of the born shepherd, if you cannot see their wants by instinct almost, if you do not understand the sheep language, as it were, keep out of sheep and do not get anyone into the business who is not a natural shepherd.

One other rock upon which you are likely to split is in joining the association and then not attending its meeting or

performing the duties of a member. So I say join the society; stick to it, and do your part.

Let me suggest some of the ways that you may be of service to yourselves and to the state: I should place first the discussion of the question of raising rape. You may say to almost any man that there are two sides to the question of whether he goes into the business of raising sheep, but once he has a flock there are no two sides to the rape question. You must raise rape; you cannot afford to be without it. Rape in this climate, on such a year as this, is good in the field up to the present time. The snow, the freezing, if you let it alone, will do no harm; and the sheep, if allowed, will go daily to it and dig it out of the snow. There is no feed that can take its place.

The results of feeding rape upon your mutton lambs, for instance, are better than those of any grain ration that the most accomplished feeder can mix, both in growth and quality of the dressed lamb. Rape-fed lambs from the Ontario experiment station stood the journey to the slaughter-house in Liverpool better than the grain-fed. At the present prices you should buy no grain for your flock. Rape and home-grown turnips should keep your animals in the pink of condition and at a very slight cost compared to that of buying grain. So I say you can be of great service to the sheep man by pushing the question of raising rape.

#### ENCOURAGE TURNIP RAISING.

Every flockmaster should have a field of turnips unless his circumstances are against it. You may as a society do well to encourage turnip raising. Clover hay, the more the better; mowed oats, dead ripe, make milk, when fed the aged in-lamb ewe, to a wonderful degree. Feed anything but timothy; never feed timothy to a sheep. You can well push the doctrine of fresh air and light, but no drafts. A dry place to lie down is imperative and the feeding-places should always be clean. Clean snow is an ideal place on which to feed sheep.

You may well preach the doctrine of regularity in feeding. Make a time of day to feed and do not vary from it. It matters little whether you feed once, twice, three or four times a day. I have seen as good results from feeding once a day as any; but, having a time, do not vary it.

Your society may preach the doctrine of careful breeding. Perhaps the greatest waste in your flocks today is caused by poor judgment and lack of purpose in breeding. Every day we meet the strangest freaks in mating farm animals, but nowhere does it assume the grotesque as it does in sheep breeding. I once knew a young man who inherited a good bunch of sheep. His father had for many years tried to build up a good type of what I call a "Canadian Leicester" sheep, and had succeeded pretty well when the young man took charge. The first thing he did was to turn in a Horned Dorset. He kept him two years, then he tried a ram bouillette for two years, and so on until he had nothing, constantly breeding without a purpose in a haphazard way. So you will do well to push the doctrine of commonsense in breeding.

You could publish the facts concerning a young man that I knew. He bought a back farm for twelve hundred dollars and ran in debt for the most of it. It was suited to sheep; our hill farms are. He bought one hundred ewes, looking out for those which had plenty of room for their dinner as well as room for the heart. He did not mind if a ewe was well along in years; if she was all right in other ways, he knew she would be a better mother for her age and more likely to bring up twins, if she had them, than some young ewes. He tried to get ewes with a fleece that would be classed as "middle wool," so as not to have to get them in in the storms. He avoided a skittish or wild animal, but he bought no high-priced stock. His rams he selected out of native flocks, and tried to get strong as well as stylish ones, but he did not pay extra prices.

## SOON OUT OF DEBT.

• He bought a brood mare and a cow and a pig. He built his open sheep sheds with such lumber and boughs as he could pick up. He put in five acres of oats, and on the back side of his field in some rough land he put five acres of rape. He planted an acre of corn and his potatoes and garden. He had his mowed oats to feed when the rape was gone. His corn made his pig and a little more, and he raised a colt. By Christmas he had ninety-eight lambs that averaged within a pound of one hundred pounds each and he got six and one half cents per pound for them. He sold one hundred and fifty dollars' worth of wool and he saved three of his best ewe lambs. He turned off the first year almost one thousand dollars. He had worked out enough to pay for the help hired, he sheared his own sheep, and, if occasion required, dressed one for market. In a few years he had a well-equipped farm, well stocked, good buildings and tools, and was out of debt. But he was a natural shepherd; he could almost talk with his sheep. Shepherds, like poets and fishermen, must be born that way.

Your society might do something towards bringing in new blood, but that should be taken up with a lot of care. I should expect that your greatest usefulness would come from working to improve your stock as you find it; not spending a lot of money to bring in new blood, but by taking care to select good stock for breeders within your own flocks. It is all right to spend money to get new blood when you really need it, but often you can do as well at home. All pure breeds of sheep, all pure breeds of any animals, are builded by home selection, not by going outside. This does not mean that you and your fathers have bred with such care that you are at the top. The most of us have been tearing down rather than building up, and we must go to an extent to those who have for generations bred with a fixed purpose. Of course we must remember that the ram is half the flock.

One of the things that will be likely to disturb a society



of this kind will be the desire of someone who is an enthusiast for some breed to get you to endorse his breed. Don't do that. There is no best breed of sheep. All the breeds are best for some place, or some conditions. As a society don't mix up in or with any one kind. I used to think there was but one breed, and there isn't for me; but I have been beaten in the show ring, on the butcher's block, and in every way by almost every breed under the sun, until all the conceit is taken out of me. I will stick by my favorites and win when I can, but we must recognize the good qualities of all breeds.

Your opportunities are great, your energy and good judgment will make your society a success. We may yet see the rough hills of New Hampshire yielding a good revenue in wool and mutton on land now covered with weeds.

Dr. Twitchell spoke upon "The Cry of the Orchard," and F. H. Buffum of Winchester, N. H., upon "Sheep Husbandry for New Hampshire."

The evening session was opened with a song by Mrs. Smith, after which Professor Taylor spoke upon "Fertilizers." A reading was given by Mrs. Maud Richardson, followed with an address by Dr. Twitchell upon "A Practical Education for Every Child." The choir rendered a song and Mr. Hadley spoke upon "The Question of the Hour." A reading by Mrs. Viola Williams closed the evening session.

### CORNISH FLAT.

A farmers' institute was held at Cornish Flat on Thursday, February 3, opening with a song by the grange choir. Invocation was by the Rev. T. C. Russell, and the address of welcome by George L. Deming, master of Park Grange, to which County Member D. C. Westgate responded. Professor Taylor spoke upon "Selection and Breeding of Corn," followed with a reading by Mrs. L. W. Harrington. Mr. Hadley delivered an address upon "Potato Growing for Profit," and Dr. Twitchell upon "Corn Improvement," speaking as follows:

## CORN IMPROVEMENT.

Farming as a science must take the place of farming for a livelihood. The output from every acre tilled must be increased, while the cost per unit must be reduced. New England leads the nation in volume of corn crop per acre, and Connecticut leads New England, yet compare the average of this state with the individual crops grown and the force of the lesson is apparent. New England is burdened by minimum averages. The man who grows forty-five bushels of shelled corn per acre in New England is dangerously near the death line, and volume alone can save. The man who is reaching after a full crop not only finds profit, but is holding back the hour of national disaster indicated by Mr. Hill. The solution of the great economic problems pressing so heavily today will be solved, if ever, through the consensus of study and effort on the part of the men who toil, the farm being the center and the farmer the final arbiter in the situation. To make possible an aggressive agriculture we must come to the clear realization that permanent success hinges upon some phase of stock husbandry and that corn must be the sheet anchor. The past has witnessed a loss in that we have fertilized for given crops and not organized to increase soil fertility. The slogan of the future must be the conservation of all natural resources as well as the growing of maximum crops. The first step in corn improvement centers in appreciation of a single kernel. One kernel will produce one ear carrying six hundred to twelve hundred kernels, and these in the second year six hundred to eight hundred ears, and in the third year six thousand to eight thousand bushels. This suggests the importance of reducing the "skips" by injecting into the seed the most of vitality as well as heredity. Two factors enter into this problem of seed improvement—variation and heredity. Variation is that universal tendency on the part of the offspring to depart from the character or type of its parents; heredity is that influence which tends to fix certain like qualities in succeeding generations. Thus

while heredity may insure an approach to a given type, it is through variation that we may hope to increase size, number of kernels and future yield. We can fix certain characteristics through heredity, but we have no control over variation. The corn breeder faces the problem of making more distinct those characteristics centering in type, and then by isolation seek to fix those variations desired, which nature is always providing.

#### OTHERS MAY DO IT.

One fact is certain, God never massed his blessings on one man's farm, and the standard set by Mr. Brewer in this state of an average of one hundred and eighteen bushels of shelled corn from twenty acres, suggests what others may do. He has shattered all old-time conceptions and stirred the gray matter in other brains to discontent with old standards. First of all establish in your own seed the heredity of productiveness, relying upon ears of length, size, and strength of kernel, and not until sure that these are fixed attempt control of natural variation, to insure uniformity of shape of ear, position of grains on the cob or perfection of tip. Unless closely guarded, any attempt to fix uniformity in type of ears to meet show requirements will be followed by loss in seed vitality. The first step is to make certain the maximum of vitality in the seed. We want to breed for a stalk of good length, stout at the base, tapering to the spindle, with abundance of broad, long leaves, with ears set a reasonable distance from the ground, below the middle line, ears which as they develop hang down rather than stand erect. Stalk improvement must precede ear improvement. Corn is both most quickly and easily controlled and also most susceptible to environment. For these reasons there must be critical care in seed selection and thorough testing before planting to determine germinating power. The policy of sending far from home for seed cannot be accepted as good practice. Great yields tell not only of seed vitality and improvement but of the purpose of the man behind, and, as in the case of the dairy cow, the level cannot be held except

there is the same clear, dominant purpose on the part of the purchaser. Improve your own seed by selecting the ears indicating most vitality and the largest in size both of kernel and length of ear. The yearly changing of seed is suicidal. You must be a breeder if you would improve.

The ten-year row test furnishes the simplest, easiest, and quickest path to fixedness of desired traits. Mark the stronger, more vigorous stalks when six inches high and follow them through the season, then take the seed for next year from that row which gives the highest average of ears large in size and fully matured, not from the best ears regardless of the row. Follow this for five years and you will practically wipe out all nonproductive kernels. On these rows remove all suckers, side shoots, immature ears, and non-bearing stalks, and also remove the pollen, before ripe and ready to fall, from diseased or weak stalks, thus eliminating the danger of injury to your seed plot. The specific requirements for greatest success in corn improvement are:

#### SUCCESS IN CORN IMPROVEMENT.

First. The deep plowing and thorough preparation of the soil. The craze for shallow plowing and the surface condition so easily obtained by latter-day machinery is preventing crop production. Work the soil and it will work for you.

Second. Make advance germination tests, using five kernels from each ear, then selecting seed from those ears which throw the largest, most vigorous stalks and which germinate first.

Third. Make ten-ear row tests on one side of the field, using ears uniform in size, large rather than small, with small cob, close-fitting rows and well-defined kernels, discarding one inch of tip and butt and throwing out imperfectly-formed kernels.

Fourth. Fertilize liberally. Apply barn dressing broadcast, high-grade corn fertilizer in the hill or drill and later broadcast or between the rows. To mature one hundred bushels of shelled corn on an acre in ninety days calls for an excess of available plant food at all times. You cannot af-

ford to force your corn roots to go out in search for food. To insure strength and vigor to stalk and rapid development of ear there must be an abundance present in the soil about the hill. When you apply one half ton of fertilizer to an acre you are dealing with infinitesimal quantities, less than one grain to a pound of soil. It pays to be liberal in scattering an abundance all through the mass of earth.

Fifth. Frequent, and, after the corn is six inches high, light cultivation. Keep this up even when you fear injury to stalks and leaves. You are conserving moisture not only for this but later crops. You cannot afford to spend good money for high-priced fertilizer with which to grow weeds.

Sixth. Select seed from the best row of the ten-row test plot and so lift yearly the yield per acre and the quality of the product. Experiments carried on by a number of farmers in Maine to improve their own seed resulted, unconsciously to them, in lifting the protein content from 10.07, the average with New England samples, to 12.65 percent. Today there's no chance for "guess-it-will-do." Only the most thorough and critical work pays, and when the farm is organized as the factory must be, and every acre made to contribute yearly in the fixed system of rotation, there will follow that old-time spirit of enthusiasm, and in the conversion of raw crops into finished products the farmer will sell his skill and labor where it will pay the best and save for more extended operations which alone can make profitable agriculture possible and insure increasing crops in return for honest toil.

At the evening session a song by the choir was followed with addresses by Professor Taylor upon "Fertilizers" and Dr. Twitchell upon "Practical Education." After a reading by Mrs. D. J. Spaulding and a song by Mrs. George Deering, Mr. Hadley spoke upon "Thorough Cultivation" and Secretary Bachelder upon "Rural Development in New Hampshire." This closed a very successful series of institutes, notwithstanding the unfavorable weather that prevailed during a portion of the week.



## ANNUAL WINTER MEETING AT EXETER, 1910.\*

---

The annual winter meeting of the State Board of Agriculture and Granite State Dairymen's Association, with the exhibition of the latter, was held at Exeter, January 13 and 14, with an attendance representing every county in the state and including representative farmers from nearly every town in Rockingham county. The exercises of the first day were in charge of the State Board of Agriculture, with the chairman, the Hon. Joseph D. Roberts, of Rollinsford, presiding.

The meeting was held in the spacious town hall, the arrangements for which were made by C. W. Barker of Exeter, who also looked after details connected with the meeting. After the invocation by the Rev. Mr. Driver and the address of welcome by Dr. A. T. Severance, both of Exeter, Chairman Roberts responded to the latter and delivered the annual address, taking as his subject, "What of New Hampshire?" and speaking as follows:

### WHAT OF NEW HAMPSHIRE?

We have assembled here today, representing the farmers of New Hampshire, called together by the Board of Agriculture, which is made up of ten members, one from each county, appointed by the governor and council, whose term of office is for three years. The members receive no compensation, but are allowed expenses necessarily incurred in the discharge of their duties. Said expenses are audited and allowed, formerly by the governor and council, at present by the state auditor, and for nearly forty years this work has

\* Including addresses delivered at Annual Winter Meeting at Contoocook in 1909.

been continued. We hold our annual summer meeting the latter part of July or the early part of August. Our winter meetings of late years have been held jointly with the State Dairyman's association some time in January. Two meetings are holden in each county annually, as arranged by the county member, and are advertised and carried out similar to our meetings of today, at which time and place live topics have been discussed by able speakers, and we certainly are much pleased with the results.

In our preparatory school for our colleges, Dartmouth, Harvard, Yale, and others, little could Dr. Phillips realize the grand scope of the work done up to the present time, giving as he gave, and at the close of the Revolutionary War, the princely sum of seventy thousand dollars to endow this grand institution, which has sent out graduates whose reputations are world-wide. Such men as Webster, Cass, Everett, John A. Dix, Bancroft, Theodore Lyman, and others too numerous to mention were graduated from this school. I would not be ungallant enough not to mention the ladies, and I know that in Robinson female seminary you have an institution Exeter might well feel proud of. The exhibits made at the show of the Horticultural Society only a few years ago were of such a nature that everyone must know that agriculture is carried on in Exeter and its vicinity in an up-to-date and progressive manner.

I do not think I would be doing my full duty to the citizens of Exeter unless I said a few words about a good friend of my father and of myself, the Hon. John D. Lyman, a member of the Board of Agriculture. No one man in New Hampshire has done so much as Brother Lyman to protect the forests of New Hampshire. None knew him but to honor and respect him.

During the last half of a century there have been many changes in agriculture and in its methods. Fifty years ago but little machinery was known on the farm; but few farmers knew what a mowing machine meant, to say nothing of

the thousand appliances now in use on the farm. There have been years of plenty and years when it seemed impossible to make both ends meet. In the last twenty-five or more years a radical change has come over the farmer's life and the farmer's home. The order Patrons of Husbandry is doing a grand and noble work in eliminating from the farmer's life that unrest, that lack of sociability, that feeling of confinement, almost unbearable. The thirty thousand members with their many meetings have been a potent factor in elevating the farmers of New Hampshire, and with better highways, better schools, better mail facilities, more and better machinery, telephone and electric cars, we have advanced materially in the last quarter of a century. While we are not tilling so many acres as in 1850, and there are not so many interested in agriculture, we have still nearly thirty thousand farmers in the old Granite State, caring for three million six hundred thousand acres. Are we living up to the enlightened order of things or are we at a standstill or gradually going backwards? The mighty waterfalls of the Connecticut, Merrimack, Cocheco, and others have been harnessed down and wonderfully developed by all kinds of manufacturing interests, and have drawn away from the farm many, too many, of our noble boys and girls, but at the same time have opened up to us a demand almost unlimited for our farm products.

Along with the manufacturing has come the summer boarder business, with its ten millions of income, demanding at our very doors fresh vegetables, eggs, poultry, berries, and other products of our farms. The value of the thirty thousand farms, as shown by the census of 1900, along with the buildings, machinery, and livestock, was nearly \$86,000,000. Of this \$10,000,000 represents the livestock. We had 34,000 horses in 1850, 78,900 in 1900. We had 267,910 neat stock in 1850, 183,358 in 1900. Thus you see the stately ox has been supplanted by the horse. We had 94,000 milch cows in 1850, and 116,000 in 1900. In 1850 we had 384,756

sheep, and only 65,318 in 1900. I presume the worthless cur makes the difference.

Of corn we planted 25,000 acres in 1900, yielding a little over 1,000,000 bushels of shelled corn, 40 bushels to the acre. We ought to plant at least 75,000 acres, and not be satisfied until we get 75 bushels to the acre. Our largest crop was that of hay, yielding in value \$6,000,000, about 1 1-5 tons to the acre, valued at \$10.30 per acre. The amount received for milk, butter, and cheese was \$6,668,000, or an average of \$52.20 per cow. Now you can tell whether old Cream Pot is doing her level best toward lifting the farm mortgage or sending the boy to the agricultural college. The number of biddies, turkeys, geese, and ducks was 880,000, valued at \$611,000. They laid 7,000,000 dozen eggs, or a yearly record of about ninety-six eggs per capita. Do you think old Speckled is doing her best to buy an automobile for the boy or a piano for the girl?

Our apple orchards, numbering a little over 2,000,000 trees, produced less than a bushel to the tree, yet we made the same year 24,261 barrels of cider, about a barrel to a farm. Cider and apples were worth \$707,000. With the brown-tail, canker worm and gypsy moth, the outlook for fruit raising, to say the least, is a little discouraging in New Hampshire. Unless these pesky pests can be relegated to the moon or some other place, fruit of all kinds must be at a big premium. The estimated value of all farm products for the year ending 1900 was a little over \$21,000,000, or an average of \$748 per farm, the average of the farms for the United States being \$8.26.

The average value per acre of the farm products of the North Atlantic states is considerably in advance of that of any other section of our country, that of the United States being \$11.42; that of Maine, \$15.55; Vermont, \$15.78; of New Hampshire, \$20.36. While the average returns per acre seem small and are small, one thing is evident, and pretty certain, the farmer of New Hampshire cannot depend upon one crop, but must necessarily produce several. He

certainly should if possible raise everything he consumes, and especially his grain, his beef, his pork and mutton, and not depend upon his western neighbor for any of these. It was wisely said by a wise poet, "Admire a large farm, but for yourself cultivate a small one."

The habit of our farmers is too much the other way. They ache for acres, and acres they get, and think the more they have the richer they are, and they attempt, and fail in the attempt, to cultivate an amount of surface that would be better tilled and yield larger returns were it divided or subdivided half a dozen times. We need right here in New England a more compact rural population, more farmers, and more tilling of small farms, with more cleanly, exact, and productive tillage. Too many of our farmers are just eking out an existence, living from hand to mouth, and are content to do so rather than exert themselves out of the ordinary. The live, active, and energetic farmer plans not for the day, but looks ahead for the future. If Dame Nature is disappointing, he stands ready to assist. If one kind of crop fails he has another and another, if necessary, to substitute for it. He does not drop all of his eggs in the same basket.

I have but little patience with the man or the speaker who says that we on the farm have perpetual sunshine; that gilt-edged butter, strawberries and cream is or ought to be the order of the day. Those of us that have lived, labored, and all our lives worked on the average New Hampshire farm know better. It means industry, economy, and eternal vigilance to secure a fair competency and nothing more. The time has gone by when anyone can run a farm and make, as the Irishman said, one end meet, to say nothing of two. It requires brains, perseverance, and sticktoitiveness to succeed. An old Indian was asked what he liked best. He replied, Three things: first, rum; second, tobacco; third, more rum. We need in farming: first, brains; second, brains, and third, more brains. Yet I firmly believe that a person of ordinary intelligence, that loves the work of Nature, is willing to put up with difficulties, that is prudent and



faithful, willing to work, can get good dividends out of the soil of a New Hampshire farm. It has been done. Why not repeat?

It is almost common knowledge that the supply of raw materials is not keeping up with the increased demand. The trend of migration is toward the cities. The immense increase in population in the United States in the last decade must of necessity make a larger demand for the products of the farm, and with demand must come better prices, and the future of the American farmer is looking better and brighter than for half a century. Few people realize how enormous are the agricultural interests of this country. In spite of the trade depression, the year 1908 was for the farmers the most prosperous in the history of the country. The total value of farm products for the year 1908 was \$7,778,000,000. In the past ten years the farmers have produced new wealth amounting to the enormous sum of sixty billion dollars. So you see the farmer is really an increasing factor in today's life.

Farming is rapidly becoming a profession. We have our agricultural schools as well as our law schools. The comic paper does not laugh as frequently as it used to laugh. It wants our subscription. The capitalist does not foreclose mortgages on the farm now. He borrows money of the owner. Let us not forget there are things on the farm above money, beyond sordid gold. I once asked a leading citizen of Rockingham county, the Hon. Frank Jones, what percent his farm, Gravelly Ridge, paid. He replied, "Percent, percent? It runs me in debt thousands of dollars annually. But it pays more than one hundred percent in enjoyment in health, and in happiness." We may not have the bank account of those living in the city, but good health, happiness, a contented and happy home, surrounded by children, studying the works of Nature, is the highest ambition of man.

There may be other places where there is a more luxuriant and teeming soil. I believe there is no place to be found within the broad limits of our native country, and a very

few places anywhere else, where the great purposes that are to be attained by human industry, stimulated by human intellect, have been more widely, more faithfully, more successfully accomplished than here on this soil of New Hampshire. I certainly believe that nowhere else within the broad limits of our country is that destiny which God has affixed to humanity more intelligently carried out than with us. There may be warmer climes and a more genial sun, but take it all for all, winter and summer, sunshine and storms, give me first and last my native land, New Hampshire.

Following this was an address by W. T. Billings, in charge of the information bureau of the Boston & Maine Railroad, who spoke as follows:

#### ADVANTAGES OF NEW HAMPSHIRE FOR FRUIT GROWING.

The advantage of fruit raising in New Hampshire which will appeal to most of us, I think, is its profit-making possibilities. When I say the apple industry is a veritable gold mine for all northern New England, I quote the words of a man I met on a train in Maine last week. I had only a few minutes for conversation, but he told me in that time that twenty years ago his original investment in a farm at Winterport, Me., was \$1,600. Last year his profit was five percent on \$60,000. In five years more he expects a return of five percent on \$300,000. This spring he is to set out twenty acres more in apple trees, as a part of his process of gradual development—trees reaching a stage of maturity every year—and he plants those trees forty-two feet apart.

That man is A. L. Blaisdell of Houlton, Me., one of the best known orchardists of the Pine Tree state, and he is engaged in that town in manufacturing. His farm at Winterport, one hundred and forty-seven miles distant, is a side issue. He has developed it and made it profitable while attending to his regular business, but now it is going ahead so fast that he has in mind giving up some of his manufacturing business and moving to Winterport to live on the farm.

What he says applies to New Hampshire and the rest of northern New England, as well as to Maine and to New Hampshire particularly; and if he has found orcharding as good as a gold mine, it is a logical conclusion that others can and will. And he has enthusiasm enough on the subject of apple-growing in this section to make the whole world sit up and take notice, if he could find the time to go around and talk about it.

We all know that gold mines with gold in them are excellent things to have, but the mere possession is not what makes the owners rich. Getting the gold out is what provides the profit. That requires energy, capital, and patience, and some men in the East who have had interests in gold mines occasionally find that a lot more of various things is demanded before there is any profit in them. In apple-growing in New England, however, all the doubtful qualities of gold mines are eliminated if energy and patience and commonsense are utilized, backed by a small amount of capital.

It is time for the old order to change. Some years ago there was an idea in New Hampshire that apples, like Topsy, "just grewed." Now it is generally appreciated that they have to be grown, in the sense that they need the care and attention devoted to other crops of an ordinary farm. The ground must be cultivated and the trees pruned and sprayed, while the packing of the fruit must be correctly and methodically and honestly done. Is there anything of hardship in these requirements? Is any reason offered why the farmers of northern New England should allow the apple growers of the West to send their fruit to the markets on the northern Atlantic coast, and steal the trade literally and figuratively from under the noses of the easterners; and this, too, when the most the westerners offer is size, color, and texture, while lacking the superb flavor that their strongest efforts in culture have failed to reproduce. New Hampshire can equal the size, color, and texture, and then, for good measure, throw in the flavor. Every apple grower in this section of the United States can do it if he will. More are com-

ing to do it. The number should be increased a thousand-fold. Yet some of our producers ought to be ashamed to drink the cider made from the apples on trees they wittingly and continually maltreat.

Just a word on packing, The marketing of all farm products of New England needs attention, and a solution for a vexatious problem should be discovered. A number of men are using considerable quantities of gray matter trying to find a way out of the difficulty, and I think it may be regarded as advisable and practicable to adopt the methods of association and coöperation in vogue in other parts of the country. These methods have been successful. For New England, while it is unfortunate that there are so many dishonest commission dealers, there is considerable satisfaction in the fact that there are not more. Some of them are all right. The department of the Boston & Maine Railroad which I represent has been in receipt of a good many complaints, and we have endeavored to investigate them. Recently an apple grower wrote me that he shipped several boxes of No. 1 apples to a Boston commission house, and had been allowed one dollar per box for them, while western boxes of the same grade were bringing three dollars and four dollars. I asked him to send me a box of the same apples, that I might see and taste them, and charge me what he thought they were worth. He did so. The charge was two dollars. I am perfectly satisfied with the trade. I never taste better apples and they were free from blemish. Yet, while nine out of ten of them were of splendid size and color, one out of ten was much smaller. The packing was uneven and irregular. I do not think for an instant that the producer intended to deceive. I believe that the packing was carelessly done. I am also of the opinion that the apples were worth much more than the one dollar per box that the commission dealer allowed. Nevertheless, the producer failed to make his case because there was a defect, of which the consignee took advantage. I suppose that, because he found about ten percent of No. 2 apples, he allowed a price for

ninety percent of that grade, twisting the ratio of firsts and seconds about in order that his own pocket might benefit. If the grower, however, had taken ten percent more pains he would have been entitled to—and probably would have received—ninety percent money.

Now that is one of the things that hurt, and the farmer is the one who pays the biggest penalty. Because he has a small fault he suffers for a great one. On the other hand, if a fight were made to produce and ship the best, and eliminate from all consideration and thought the idea that the “almost as good” may answer, half the controversy with the commission houses will have been settled in the farmer’s favor, because, then, every producer would know and could prove that he had shipped the best and that he was entitled to the best pay.

The change is advisable in other directions also. Agricultural methods must move with the world, if the advantages of civilization are worth anything to us. There is no reason why the farm homes should not have all the comforts and conveniences of those in the city, but they cannot be gained by grumbling and loafing. Men secure additional advantages in life for their families and themselves by giving body and mind to the task, whatever their spheres may be; not by bemoaning fate and wondering why things are easier for “some folks.” I think all of us know not a few actually unfortunate persons who do less bemoaning than many of those who have nothing to complain of except their own laziness—and usually they fail to recognize that.

Many of us have marveled at the prosperity of the potato producers of Aroostook county in Maine; not a few farmers envy them. Prof. Charles Woods, director of the Maine agricultural experiment station, told me last week that generally all of northern New England was as well adapted for growing potatoes as Aroostook county. Somewhat different methods should prevail, however. Aroostook has a more plentiful rainfall and longer days for a shorter season, but there is as much danger that Aroostook will get too much



rain as there is that other sections will not get enough, and a variance in the plan of cultivation will compensate for the difference in sunlight, while the marketing conditions of other sections are superior. Northern New England could supply potatoes for the whole of the United States, if need be; but the way to do it would be to fertilize and work and rotate and market as they do in Aroostook, with minor modifications of detail.

Professor Woods also told me that Mr. Charles S. Pope of Manchester, Me., has cows that produce seven hundred pounds of butter per annum, as against from three hundred to three hundred and fifty pounds for the average. Mr. Pope sends cream to Boston and suburbs that keeps sweet for two weeks. You know more of this matter than I do; I only desire to make the point that Mr. Pope is moving with the world, and I assume his object is to secure more happiness and prosperity for his family and himself. If he is successful, it must be admitted that he deserves his reward.

I refer to those matters because advance in one line, such as fruit growing, must mean advances in others. If more and better apples are grown, there should be more and better potatoes, more and better dairy products, more and better poultry, and so on. The pioneers in these various departments have shown that the things can be done; the people should study the examples and follow, just as in the days of our forefathers the men of resource sought and fought their way into the wilderness and cleared the way for others to follow and continue the work of development.

I aim to do a little agricultural pioneering myself, although in farming matters I am only a student. I believe good melons can be raised on the southern shores of Lake Winnepesaukee by the Montreal method, which is merely to keep them covered in frames until the melons get big enough to break the glass. I know that some of the most luscious melons to be found are raised on the banks of the Piscataqua river, because I buy them in Dover every fall. It is a fact that the Montreal melons bring fabulous prices in New York.

I intend to set out some frames. I do not care if each melon I grow costs two dollars, if I am successful in establishing that the Montreal melons can be grown satisfactorily on the shores of the lake.

If they can be, there are dozens of other places in New Hampshire suitable for their production. Once they are grown, I am very confident that fruit growers who know the business will reduce the cost of production. There is room enough for success in details if the one important fact is established.

We must all put our shoulders to the wheel and help. Each one can do his share in gaining benefit for the whole state. The Boston & Maine Railroad is helping now by advertising New Hampshire as it never has been advertised before. People are interested and are constantly making inquiries. The citizens of the state, then, must convince the strangers that there are good opportunities here in almost any branch of agriculture or business effort. Get the people to come and help them to learn that they can gain satisfactory returns from farming investments. Many want to come if they think there is a chance for victory. They expect obstacles because they know there is no such thing as victory unless obstacles are overcome.

## EXPERIMENTS IN ROTATIVE CROPPING, AND MANURING.

BY DR. H. J. WHEELER.

Director Rhode Island Agricultural Experiment Station.

### INTRODUCTORY REMARKS.

Systematic crop rotation has been studied and practiced far more in Europe than in the United States. In fact, the natural tendency in any new country is to grow the crop or crops which will yield the greatest profits utterly without consideration for the future fertility of the soil. The result of this is seen in many of our present depleted lands in

New England, particularly in the South, where cotton and tobacco have been the staple crops not only within the recollection of the oldest living inhabitants but even for several generations. The same procedure is now depleting the magnificent wheat soils of the great Northwest. Its destructive effect has already been recognized in the great Middle West and even California is now being driven to the use of commercial fertilizers.

The natural consequence of such a wild scramble for the greatest possible financial returns from one or two staple crops has led to the inevitable neglect of crop rotation as a means of conserving soil fertility. One need but travel through New England on the railway to observe that we not only have an enormous amount of land that is scarcely paying for the items of taxes and interest but that there exists a gross neglect of system in many of our farming operations. This is shown conclusively by the runout grass lands and the general air of shiftlessness and neglect visible here and there on so many farms. Even at the risk of raising a whirlwind of opposition equal to one once met in our own state by a similar statement, it seems but truthful to assert that more systematic business methods, greater attention to crop rotation and rational manuring are still among the greatest needs of New England agriculture.

Every well-ordered farm should be divided into fields of suitable size. Furthermore, the area of each field should be definitely known. This is necessary in order that rational manuring may be practiced. There is probably no one here today who cannot recall instances where, owing to a faulty estimate of areas, fertilizer has been applied in excess of the amounts that could be expected to be profitable or where crops have been seriously curtailed by errors of judgment in the opposite direction.

The choice of a rotation or rotations and of the manures must be governed by many different considerations. If one has to deal with a dairy farm, then corn, clover, and other forage crops must receive first consideration. In such cases

the greatest of all the problems is the profitable production on the farm of as large a portion of the nitrogenous part of the ration of the stock as is possible, and the proper preservation and return to the land of the various farm manures. In the major portion of New England, alsike and red clover, two of the nitrogen gatherers, are vital to success, and these may possibly be supplemented by cow peas and soy beans. Wherever alfalfa can be grown this may partially or wholly supersede the clovers, but in much of New England the alternate thawing and freezing throughout the major portion of the winter with the soil saturated with water and often unprotected by snow, makes alfalfa, until better acclimated or until represented by more suitable varieties, a fickle and uncertain crop. Farther north, the protection of a continuous mantle of snow; to the south, the milder climate, and farther west the more arid regions furnish more nearly ideal conditions for this crop.

#### ADVANTAGES OF ROTATIVE CROPPING.

A few of the advantages to be gained from rotative cropping are here introduced from a bulletin of the Rhode Isl- and Agricultural Experiment Station:

“(1) All plants do not draw to an equal extent upon the various manurial ingredients of the soil. Furthermore, plants are unlike so far as concerns their power to assimilate individual ingredients. This is probably due to their sending their roots to different depths and also to an unlike solvent action of the root juices upon the constituents of the soil.

“(2) By rotating crops, injury by insects is lessened.

“(3) Losses caused by fungus and bacterial diseases may also be materially reduced.

“(4) The soil is maintained in good tilth, which is an item of great importance. Certain minute organisms which are helpful to plants are more likely to increase in soil where crops are rotated than where no regular system exists.

"(5) Weeds are more readily eliminated or avoided when crops are regularly rotated than under an irregular, slipshod system of farming."

#### A SPECIAL FIVE-YEARS ROTATION.

For the farmer located near a town, who has the means of properly organizing such a business, a combination of crops for the dairy and for trucking may be excellent. These may be combined in a single long rotation; or a rotation of trucking crops may alternate with another distinct relation of fodder crops. A rotation designed to meet the former purpose has now been studied for about fifteen years at the Rhode Island station. It is as follows:

First year. Oats for hay, sown with clover and grass.

Second year. Clover and grass.

Third year. Potatoes.

Fourth year. Winter rye for either fodder or bedding, followed by Hubbard squashes.

Fifth year. Onions.

As originally planned, early peas followed by Swedish turnips were to be introduced in the fifth year of the rotation, but after a trial of the plan for a few seasons these crops were replaced by onions. The reason for this change of plan was that the soil, being a silt loam, was not sufficiently light and early to produce extra early or even moderately early peas, and it was also too compact for Swedish turnips of the highest market grade. In fact, they develop many side roots, and the tap root is often branched: conditions far less likely to result in a sandy loam. The soil was, however, sufficiently compact to furnish an excellent seed bed and good general conditions for onions.

The plan for manuring has also been modified slightly from time to time. In addition to the application of the regular fertilizers, liming was rendered necessary in order to insure full success with clover, onions, peas, and certain of the other crops.



The following were the chemical manures applied for oats in the earlier years of the experiment:

Pounds per acre for oats:

300 nitrate of soda.

240 acid phosphate.

180 finely ground, steamed bone.

120 muriate of potash.

This formula was employed from 1893 to 1897, inclusive. In 1898 it was modified by reducing the application of nitrate of soda from three hundred to two hundred pounds per acre. This was done for the reason that the oats grew very large and tended to lodge, and because it was evident that decidedly less nitrogen was required than at first.

In 1901, floats (finely ground, unacidulated phosphate rock) at the rate of two hundred and seventy pounds per acre were substituted for the one hundred and eighty pounds of bone employed previously. This change was made upon the basis of assertions by one or two authorities in Europe that the phosphoric acid of bone meal was no more available to plants than that of floats.

Experiments at the Rhode Island station, however, threw so much doubt upon the immediate value of floats that their use in this and other rotations was finally abandoned until their value should be more definitely established.

In 1902 it was decided to apply in the future definite amounts of *nitrogen*, *potash*, and *phosphoric acid* annually, instead of definite amounts of chemicals which necessarily vary somewhat in composition from time to time.

The quantities determined upon were the following:

Pounds per acre for oats:

32 nitrogen, from nitrate of soda.

40 phosphoric acid, from acid phosphate.

80 phosphoric acid from finely ground bone (reduced to 40 pounds the following year).

80 potash from muriate of potash.

To furnish the above amounts there were required about 210 pounds nitrate of soda, 275 pounds acid phosphate, 310 pounds bone, and 160 pounds muriate of potash.

The gradually increasing fertility of the land rendered possible a *further lessening of the manures, in 1905, to 30 pounds of phosphoric acid from acid phosphate and to 16 pounds of nitrogen from nitrate of soda.* At the same time, however, the supply of potash was increased from 80 to 100 pounds, yet, nevertheless, the total cost of the manures was less than before.

The reduction in manures just mentioned was followed in 1906 by cutting down the phosphoric acid from acid phosphate to 25 pounds and in bone to 35 pounds per acre; and again in 1907 by the entire omission of the bone meal.

The following are the yields of oats:

#### YIELDS OF OATS, PER ACRE.

Year.	Bushels grain.	Tons straw.
1893 .....	crop failed.*	
1894 .....	25.3	1.05
1895 .....	Lodged badly; not weighed.	
1896 .....	51.6	3.40
1897 .....	29.6	2.73
1898 .....	27.6	2.56
1899 .....	36.1	2.13
1900 .....	41.3	2.49
1901 .....	25.5	2.10
1902 .....	56.2	2.03
1903 .....	40.0	2.16
1904 .....	39.4	2.00
1905† .....	—	Hay 3.45
1906† .....	—	Hay 2.25
1907 .....	38.9	2.07
1908 .....	37.1	1.25

\* Land not yet limed.

† Cut green and cured for hay in order to save clover from loss by droughts.

The clover crop, following the oats, has never been manured. The yields have been as follows:

YIELDS OF FIELD CURED CLOVER HAY, TONS PER ACRE.

Year.	First crop.	Second crop.	Total.
	*	*	*
1894 .....	*	*	*
1895 .....	1.55	.95	2.50
1896 .....	2.20	1.45	3.65
1897 .....	1.68	1.33	3.01
1898 .....	3.21	1.58	4.79
1899 .....	2.28	.96	3.24
1900 .....	1.23	.30	1.53
1901 .....	1.25	1.03	2.28
1902 .....	2.18	1.50	3.68
1903 .....	1.50	1.47	2.97
1904 .....	†	†	†
1905 .....	3.25	2.00	3.25†
1906 .....	2.25	1.65	3.90†
1907 .....	3.35	.86	4.21†
1908 .....	1.55	0.00	1.55§

The potato formula employed was as follows from 1893 to 1900, inclusive:

Pounds per acre:

105 nitrate of soda.

750 tankage.

540 acid phosphate.

120 finely ground, steamed bone.

300 muriate of potash.

In 1902 floats were harrowed in at the rate of 608 pounds per acre before planting, in addition to the other manures; but their application was not continued in later years.

In 1901 the preceding formula was replaced by the following one:

\* Land not yet limed and hence the crop failed.

† Clover killed by the drought in 1903, and crop of 2.6 tons per acre of oat hay was secured in its place.

‡ Clover and redtop.

§ Clover all winter killed. Seeded with redtop and timothy.

## Pounds per acre:

32 nitrogen from nitrate of soda (required about 200 pounds of nitrate).

32 nitrogen from dried blood (required about 300 pounds of blood).

130 phosphoric acid from acid phosphate (required about 807 pounds of acid phosphate).

150 potash from muriate of potash (required about 300 pounds of the muriate).

In 1904 the quantity of phosphoric acid was reduced to 100 pounds per acre, requiring about 610 pounds of acid phosphate.

In 1907 the nitrogen from nitrate of soda was reduced from 32 to 25 pounds (required about 157 pounds of nitrate of soda) and the amount of phosphoric acid was again reduced from 100 pounds to 91.5 pounds per acre.

Below are given the yields for a series of years:

## YIELDS OF POTATOES, PER ACRE, IN BUSHELS.

Year.	Large.	Small.	Total.
1893 .....	69	62	131
1894 .....	170	64	234
1895 .....	84	33	117
1896 .....	135	103	238
1897 .....	232	92	324
1898 .....	326	68	394
1899 .....	190	102	292
1900 .....	239	42	281
1901 .....	153	82	235
1902 .....	287	27	314
1903 .....	291	15	306
1904* .....	134	19	153
1905* .....	103	12	115
1906 .....	203	28	231
1907† .....	250	17	267
1908 .....	213	24	237

\* Rotted badly. Season very unfavorable.

† Crop greatly reduced by poor vitality of the seed tubers.

For the rye 360 pounds per acre of finely ground, steamed bone were applied in the autumn before seeding from 1893 to 1900, inclusive. In 1901 an application of 180 pounds per acre of phosphoric acid in floats was made. The following year bone was again employed in such quantity as to supply 180 pounds of phosphoric acid per acre. Since 1902 no fall applications have been made. Nitrate of soda was applied as a spring topdressing from 1895 to 1902, inclusive, at the rate of about 120 pounds per acre, but the straw was so tall that it was finally thought to be unnecessary and was then discontinued. In the spring of 1906, muriate of potash was applied similarly at the rate of 100 pounds per acre, but this has not been continued. It may be said that with the exception of an occasional unfortunate experience the yields of green rye, cut when in the milk, ranged from about 3 to 4 tons per acre to as high as 6.75 tons.

Immediately after the removal of the rye crop, the land is prepared for Hubbard squashes by broadcasting and plowing under *horse manure at the rate of four cords per acre*. In addition chemical manures are applied either wholly broadcast or about one half in the hill, depending upon the amount of moisture in the soil at the time of planting. The formula used from 1893 to 1900, inclusive, was about as given below, with slight variations from year to year as affected by the grade of the acid phosphate.

Pounds per acre:

105 nitrate of soda.

300 tankage.

540 acid phosphate.

150 muriate of potash.

In 1901 the nitrate of soda was increased to 330 pounds per acre and the amount of acid phosphate was made 500 pounds. The following year nitrogen, phosphoric acid, and potash were applied at exactly the rates of 52, 80, and 75 pounds per acre, respectively, in the shape of nitrate of soda,



acid phosphate, and muriate of potash, the actual amounts of chemicals required being essentially the same as in 1902.

In 1903 the manuring was the same. In 1904 the amount of potash per acre was lowered to 37.5 pounds, but it was again restored in 1905 to the former amount. In 1906 the quantity of phosphoric acid per acre was reduced from 80 pounds to 60 pounds and the quantity of nitrogen from 52 to 30 pounds. These latter amounts require about 400 pounds of acid phosphate and about 200 pounds of nitrate of soda.

Below are given the yields of Hubbard squashes which have been secured:

TONS OF SQUASHES, PER ACRE.

1893	.....	*
1894	.....	9.54
1895	.....	5.85
1896	.....	4.70
1897	.....	0.69
1898	.....	2.45
1899	.....	7.16
1900	.....	†
1901, cabbages	.....	†13.8
1902	.....	7.39
1903	.....	5.42
1904	.....	8.93
1905	.....	6.38
1906	.....	9.90
1907 (drought)	.....	1.20
1908	.....	10.30

It is unnecessary to give the results with early peas and Swedish turnips for the reason that onions have now been substituted for them.

It should be remarked that on this land success with onions is impossible without the application of generous

\* Crop a complete failure.

† Crop failed, due to drought; but in 1901 a crop of 13.8 tons of late cabbage was secured. These plants were set after the squashes gave assurance of failure. The same might have been done in the previous year.

amounts of lime, wood ashes or excessive amounts of stable manure. The effect of the manure, however, unlike that of the other materials, is quite temporary in character.

#### FORMULA FOR ONIONS.

(Harrowed in Before Planting the Seed.)

Pounds per acre:

60 nitrogen (requiring about 375 pounds nitrate of soda).

100 phosphoric acid (requiring about 600 pounds of acid phosphate).

150 potash (requiring about 300 pounds muriate of potash).

In 1904 an additional application of half the above amount was made, on July 13, between the drills.

In 1905 the first application was increased, and the second omitted entirely. The manures used were:

Pounds per acre:

70 pounds nitrogen (requires about 450 pounds nitrate of soda).

140 phosphoric acid (requires about 825 pounds of acid phosphate).

225 potash (requires about 450 pounds muriate of potash).

In 1906 the manuring was the same excepting that half of the nitrogen was applied in dried blood and half in nitrate of soda. It was thought that this would be advantageous in view of the long growing season and the possibility of the loss of nitrates by leaching. In 1907, however, the amount of nitrogen employed as dried blood was reduced to 15 pounds per acre and that as nitrate of soda was raised to 40 pounds.

The yields of onions have been as follows:

Year.	Bushels large.	Bushels small.	Total.
1904 .....	420	135	555
1905 .....	232	166	398
1906* .....	94	16	110
1906 cabbage set between, yielded twelve tons per acre.			
1907 .....	260	118	378
1908 .....	548	49	597

It should be borne in mind that in the interval from 1893 to 1910 the land will have received the equivalent of about 3,600 pounds of actual or burned lime (calcium oxid) per acre. It is planned in the future to lime the land at each round of the rotation (once in five years) before planting to onions, at the rate of about 667 pounds of actual or fresh burned lime per acre; which would be equal to about 133 pounds per annum.

It has been found to be of the utmost importance that grass seed be sown with the clover so that if the clover crop fails, on account of drought or winter-killing, a grass crop can be secured; for grass resists these conditions much better than the clovers.

In case the season is very dry and gives promise of continuing so, it may be necessary to harvest the rye even earlier than usual in order that it may not draw too much water from the soil. It even remains a question, where danger of injury from drought is great, if it might not be better economy to turn the rye under when very small or to cut it even when quite immature for soiling purposes, and to plant the squashes at once than to run the risk of the soil being too dry at the time when the rye would naturally be cut. It would seem that the assurance of a good crop of squashes as compared with complete or partial failure would far more than offset the gain in the longer period of growth of the winter rye.

\* A very poor stand was secured and cabbages were set between the onions.

Among the other rotations now in progress at the station are the following:

### THREE-YEARS ROTATION.

(Chemical Manures Only.)

- 1st year potatoes grown on a clover sod.
- 2d year winter rye (replacing winter wheat if desired).
- 3d year clover and grass.\*

Where the price of rye straw for bedding is high, it may pay better to employ it in the rotation than winter wheat. This must be determined by the local situation. Only home-mixed chemical manures are used in this rotation.

### FOUR-YEARS ROTATION.

- 1st year potatoes on clover sod.
- 2d year winter rye (followed by a crop of clover in the same year, when sufficiently moist).
- 3d year clover and grass.
- 4th year Indian corn.

Stable manure is broadcasted and plowed under at the rate of four cords per acre for the Indian corn, but the other manures are all home-mixed chemicals.

### FIVE-YEARS ROTATION WITHOUT CLOVER.

- 1st year Indian corn on grass sod.
- 2d year potatoes (seeded same autumn with winter rye and grass seed).
- 3d year winter rye.
- 4th year grass (timothy and redtop).
- 5th year grass (timothy and redtop).

### FIVE-YEARS ROTATION WITH CLOVER.

This rotation is exactly identical with the foregoing one, excepting that late in March or early in April, following the

\* The grass has been introduced in recent years on account of the occasional loss of the clover by drought or winter-killing.

seeding with rye and grass, clover seed is sown on the surface of the fields. This is done preferably on a light fall of fresh snow, but in such a case only after the old ice and snow of winter have disappeared. The snow aids one in making sure that the seed has been sown evenly, for it is readily visible on the surface. Home-mixed chemicals are the only manures used in this rotation.

#### SIX-YEARS ROTATION.

- 1st year Indian corn on grass sod.
- 2d year potatoes (seeded the same year with winter rye and grass seed; clover seed sown the following March or April).
- 3d year winter rye (followed in the same year by crop of clover if the season is not too dry).
- 4th year clover and grass.
- 5th year grass (timothy and redtop).
- 6th year grass (timothy and redtop).

At the outset, two lots of land in this rotation were manured with lime and chemicals, two with wood ashes and chemicals, and two with stable manure and chemicals. The reason for comparing lime and chemicals with wood ashes and chemicals was that earlier many farmers in Rhode Island held that the lime of the wood ashes possessed some special value on account of having once been in a plant, and it was thought that there was some magic virtue in wood ashes not capable of being supplied by stony lime and chemical manures. After continuing the work for a few years, it became apparent that everything could be accomplished with lime and chemical manures that was possible with the aid of wood ashes, and, furthermore, that the expense was often somewhat less when these were substituted for the ashes. At present three of the lots of land are being manured solely with chemical fertilizers and three receive horse manure at the rate of four cords per acre, in place of chemicals, before the Indian corn. The other treatment is identical in every



particular with that of the lots of land which receive no stable manure.

The early indications were to the effect that the three-year and four-year rotations were excellent for beginning the improvement of neglected land, but it was nevertheless of vital importance how the rotations began. The best way to begin these two rotations, or, in fact, any of the others mentioned, has been to plow in the summer after the grass is cut, roll with a good land roller, harrow once, lime, and seed with winter rye and grass seed, the clover to be sown the following March or April. From this it is not to be inferred that autumn seeding with clover is impossible, yet it is uncertain, and, having never failed in sixteen years to secure a good stand when it is sown in the spring this plan is now invariably followed, at least whenever grass seed and winter grain are sown together.

Rye has been found in the course of these experiments to be remarkably able to succeed, where potatoes and Indian corn fail to be profitable on account of the poor tilth of the soil. The clover and grass which follow the rye for the next one to three years can readily be made to yield profitable returns by employing suitable topdressings of chemical manures, and when the original sod has rotted and the new sod formed by the renewal of clover and grass has been turned under, the conditions of tilth have been found to be so greatly improved that the profitable production of Indian corn and potatoes becomes possible. In fact, the difference between moderate losses and handsome profits has frequently hinged upon this particular point and upon the liming of the land at the very outset.

Another vital feature in connection with these rotations is never to sow clover seed unaccompanied by grass seed. This is important, for it has happened on an average of about every seven to eight years that, owing to excessive drought after the cutting of the rye, the clover has been entirely destroyed; and about as frequently much of the clover, particularly on the more level areas, has been injured or destroyed by winter-killing.

It ought to be stated that the land upon which all of these experiments have been conducted was so neglected and exhausted when they were begun it did not produce over 400 to 500 pounds per acre of a mixture of poor hay consisting largely of weeds. After growing Indian corn continuously on this land for four to five years without manure, the plants were unable to attain a height of more than from 4 to 6 *inches* in an entire season.

The attempts to grow Indian corn and potatoes, at the beginning of the rotation, on land of this character, were accompanied by financial loss, poor crops resulting notwithstanding the application of generous amounts of chemical manures; but, begun with rye, as described above, the rotation was made profitable at once.

#### THE MANURES.

At the outset nitrate of soda was applied as a spring top-dressing to the rye, in all of the rotation, at the rate of about 120 pounds per acre, but with the lapse of time, the vigorous growth of straw, a depreciation in the yields of grain, and a failure to secure fully satisfactory results with clover, led to the entire omission of this topdressing and the substitution for it of 100 pounds of muriate of potash per acre. This has now been replaced by high-grade sulphate of potash, out of consideration for its being probably more favorable to the growth of clover than the muriate.

The following formula was used at the outset for the other crops:

#### FORMULA FOR INDIAN CORN.

Pounds per acre:

300 nitrate of soda.

450 acid phosphate.

120 muriate of potash.

## FORMULA FOR POTATOES.

(Superseded in 1901.)

Pounds per acre:

- 105 nitrate of soda.
- 750 tankage.
- 540 acid phosphate.
- 120 finely ground bone.
- 300 muriate of potash.

This was applied at the outset partly broadcast and partly in the drill, but now all of the fertilizer is used in the drill. After the removal of the potato crop, and before seeding to rye and grass, the following application was made broadcast:

Pounds per acre:

- 360 finely ground, steamed bone (discontinued after the year 1900).

## FORMULA FOR GRASS.

(Superseded in 1901.)

Pounds per acre:

- 120 nitrate of soda.
- 300 dissolved boneblack (or its equivalent of acid phosphate; that is, about the same weight of high-grade acid phosphate or still more of the low grade).
- 120 muriate of potash.

## FORMULAS ADOPTED AT A LATER DATE.

## INDIAN CORN.

Pounds per acre:

- 35 nitrogen (requires about 220 pounds nitrate of soda).
- 75 phosphoric acid (requires about 470 pounds acid phosphate).
- 60 potash (requires about 120 pounds muriate of potash).

In 1905 this application was reduced from 35 to 25 pounds of nitrogen per acre, and in 1897 the phosphoric acid was reduced from 75 to 60 pounds per acre.

This reduction in nitrogen can possibly be carried still further, perhaps even to complete elimination on land in grass that has been topdressed annually, since Indian corn seems to have special ability to draw its supply of nitrogen from decaying sod when the stand of grass has been good. Indian corn can also draw its supply of phosphoric acid from soils where turnips and cabbages would suffer seriously for lack of it, which explains one of the reasons for cutting down the earlier supply of phosphoric acid. Another reason for this reduction has been that liming has been found to render available to the plants large stores of phosphoric acid already in the soil, which would remain, otherwise, very largely unavailable to the crops.

#### POTATOES.

In the year 1901 floats were applied broadcast before planting, at the rates ranging from about 365 to 725 pounds per acre, but due to doubt as to the efficiency of the floats this application was not continued in subsequent years.

#### POTATO FORMULA.

Pounds per acre:

32 nitrogen, from nitrate of soda (requiring about 200 pounds of the nitrate).

32 nitrogen, from dried blood (requires about 300 pounds of blood).

130 phosphoric acid (requires about 800 pounds of acid phosphate).

150 potash (requires about 300 pounds muriate of potash).

If dried blood of good quality cannot be secured the preceding formula may be modified by substituting for the blood 500 to 550 pounds of tankage, and in this case the amount of acid phosphate may be reduced to about 600 pounds per acre.

In 1905 the quantity of phosphoric acid was decreased from 130 to 100 pounds, in view of the heavy applications made in the previous years and for reasons mentioned previously.

In 1907 the quantity of nitrogen from nitrates was reduced from 32 pounds per acre to 25 pounds, and the amount of phosphoric acid applied per acre was further reduced to 91.5 pounds.

#### GRASS.

Pounds per acre:

54 nitrogen (requires about 350 pounds nitrate of soda).

75 phosphoric acid (requires about 465 pounds acid phosphate).

100 potash (requires about 200 pounds of muriate of potash).

In 1904 the amount of phosphoric acid was reduced from 75 pounds per acre to 65 pounds, since which time no further changes have been made.

While it is impossible in this connection to discuss all of the yields secured in these various rotations, it is of particular interest to note the wonderful increase in hay resulting in 1901, and, subsequently, by the change from the earlier to the later ration for grass. In the earlier years there was occasionally a large crop of hay when the conditions for the growth of clover were favorable or where the clover crop the previous year was good, but the yields usually fell off to such an extent the third and fourth years the land was in grass that the profits from the rotation were greatly lessened or likely to be largely wiped out. The change in the grass ration raised the rotation at once to a decidedly remunerative basis. This will be readily appreciated by a study of the following table taken from the results with the six-years rotation:



## FIRST COURSE OF ROTATION.

## Earlier Formula Used.

Plat No.	Year.	Tons of hay per acre.
6 .....	1894	0.68
8 .....	1894	1.15
4 (wood ashes, '93) .....	1895	2.81
6 .....	1895	1.13
8 .....	1895	1.28
2 (limed, 1894) .....	1896	5.83
4 .....	1896	4.61
6 .....	1896	1.38
2 .....	1897	3.03
4 .....	1897	2.63
10 (limed, 1896) .....	1897	*0.57
12 (limed, 1894) .....	1897	2.48
2 .....	1898	3.37
10 .....	1898	3.84
12 .....	1898	2.54
8 (wood ashes, '97) .....	1899	3.54
10 .....	1899	1.65
12 .....	1899	1.58
10 .....	1900	1.50

## SECOND AND THIRD COURSES OF ROTATION.

Plat No.	Year.	Tons of hay per acre.
6 (limed, 1897) .....	1900	1.65
8 .....	1900	2.49
New Formula Introduced Here.		
4 .....	1901	5.12
6 .....	1901	3.40
8 .....	1901	3.80
2 .....	1901	*0.67
2 .....	1902	5.58
4 .....	1902	4.18
6 .....	1902	3.98
12 .....	1902	*1.40

Plat No.	Year.	Tons of hay per acre.
2 .....	1903	4.66
4 .....	1903	4.11
10 .....	1903	*0.67
12 .....	1903	5.32
2 .....	1904	4.26
10 .....	1904	3.96
12 .....	1904	5.00
8 .....	1904	*1.66
8 .....	1905	†3.50
10 .....	1905	3.55
12 .....	1905	3.48
6 .....	1905	*1.15
6 .....	1906	4.36
8 .....	1906	3.42
10 .....	1906	2.93
4 .....	1906	1.54
4 .....	1907	4.64
6 .....	1907	3.70
8 .....	1907	3.25
2 .....	1908	3.27
4 .....	1908	3.67
6 .....	1908	†2.79

These results show that a parsimonious treatment of grass land is not accompanied by the greatest profit. Indeed, in another experiment where the land had been in grass for eight years and where the yield had been maintained by annual topdressings at an average of over four tons per acre for the first six years, and where it did not fall below 3.25 tons even the last year, it has been found possible to produce two successive splendid crops of Indian corn without any manure whatever. The decaying grass sod has proved to be an efficient manure, supplemented by the other stored-up organic and inorganic manurial constituents of the soil.

\* Clover following rye crop in same year.

† Suffered from winter-killing in spots.

Concerning the most profitable amounts of chemical manures to apply to grass land, the experiments at the Rhode Island Station have shown that, where other manures are not used, the usual limit of profit for nitrogen is 54 pounds per acre. This would be supplied by about 350 pounds of nitrate of soda. In fact, 400 pounds of nitrate were apparently often above the limit which insured the greatest profit. For phosphoric acid the limit seems to be reached with about 75 pounds per acre, requiring about 500 pounds of acid phosphate. For potash the maximum limit seems to be reached with 175, requiring 350 pounds of muriate of potash, though it is probably usually reached with a limit of 200 to 300 pounds of muriate of potash.

By the course of manuring and rotation outlined, the yields of corn stover have risen from about 1.25 to 1.75 tons per acre, to from 2.5 to over 4 tons per acre; and the yields of hard-shelled corn have risen from 12 bushels per acre to yields usually ranging from 60 to 75 bushels and even touching records of 82 to 90 bushels in the most favorable seasons.

The great gain in the potato crops in the more recent years, except for an occasional instance of rot or poor "seed," is well illustrated for all rotations by the results in the five-years rotation discussed in detail at the outset.

Thinking that it would be of interest to know if the formulas employed in the three-years, four-years, five-years, and six-years rotations were being used in too large or too small quantities, three uniform plats of land were selected, all of which received the same treatment as those in six-years rotation, excepting that one received only two thirds the amount of chemical manures and one only one third the amount used in that rotation. It may be of interest to those who think of using any of these formulas to see the results with the full, two thirds, and one third rations, hence they are given below. In order to show the degree of uniformity of the plats at the outset the yields of Indian corn produced on them in 1897 without manure are given below.

	Yield in lbs.
Plat 71 (to receive the $\frac{1}{3}$ rations later).....	93.5
Plat 73 (to receive the $\frac{2}{3}$ rations later).....	69.0
Plat 75 (to receive the full rations).....	40.5

It will be seen that the precaution was taken to select the least fertile plat to receive the full ration of manures so that if either the one third or two thirds ration appeared to be insufficient there could be no doubt about the correctness of the conclusions.

## RESULTS IN 1898 WITH INDIAN CORN.

	Tons of stover per acre.	Bushels of hard corn per acre.
Plat 71, $\frac{1}{3}$ ration .....	.28	.71
Plat 73, $\frac{2}{3}$ ration.....	.32	1.42
Plat 75, full ration.....	.40	3.57

These yields show in the most striking manner the poor results to be expected from a good formula of chemical manures, unless the tilth of the land has first been improved by other means. Grass, as may be observed, is far less affected in this respect than Indian corn and potatoes.

## RESULTS WITH POTATOES, 1899.

	Bushels of large potatoes per acre.	Bushels of small potatoes per acre.	Total bushels per acre.
Plat 71, $\frac{1}{3}$ ration.....	9.83	45.8	55.6
Plat 73, $\frac{2}{3}$ ration... ..	18.8	43.3	62.1
Plat 75, full ration.....	30.2	37.5	67.7

## RESULTS WITH RYE, 1900.

	Bushels of rye per acre.	Tons of straw per acre.
Plat 71, $\frac{1}{3}$ ration.....	14.4	1.17
Plat 73, $\frac{2}{3}$ ration.....	16.8	1.79
Plat 75, full ration.....	20.9	1.97

## RESULTS WITH GRASS.

	Tons of hay per acre.
Plat 71, $\frac{1}{3}$ ration, 1901.....	2.79
Plat 73, $\frac{2}{3}$ ration, 1901.....	3.75
Plat 75, full ration, 1901.....	4.78
Plat 71, $\frac{1}{3}$ ration, 1902.....	2.38
Plat 73, $\frac{2}{3}$ ration, 1902.....	2.95
Plat 75, full ration, 1902.....	4.62
Plat 71, $\frac{1}{3}$ ration, 1903.....	1.55
Plat 73, $\frac{2}{3}$ ration, 1903.....	2.40
Plat 75, full ration, 1903.....	3.25

## RESULTS WITH CORN, 1904.

	Tons of stover per acre.	Bushels of hard corn per acre.
Plat 71, $\frac{1}{3}$ ration.....	2.60	63
Plat 73, $\frac{2}{3}$ ration.....	2.94	68
Plat 75, full rations.....	3.78	84

## RESULTS WITH POTATOES, 1905.

	Bushels of large potatoes per acre.	Bushels of small potatoes per acre.	Total bushels per acre.
Plat 71, $\frac{1}{3}$ ration.....	92	15	107
Plat 73, $\frac{2}{3}$ ration.....	111	15	126
Plat 75, full rations.....	113	13	126

## RESULTS WITH RYE, 1906.

	Bushels of grain per acre.	Tons of straw per acre.
Plat 71, $\frac{1}{3}$ ration.....	6.3	.70
Plat 73, $\frac{2}{3}$ ration.....	16.3	1.37
Plat 75, full rations.....	18.0	1.52

## RESULTS WITH HAY.

	Tons of hay per acre.	
	1907.	1908.
Plat 71, $\frac{1}{3}$ ration.....	1.51	2.15
Plat 73, $\frac{2}{3}$ ration.....	2.68	2.85
Plat 75, full rations.....	4.33	4.10



It will be seen that the grass crop shows in the most striking degree the effect of the curtailment of the manures, and it would appear from even a casual inspection of the results that two thirds the quantities of manures that have been used in the rotations would prove far less profitable than the full amount, though unfortunately time has not been afforded to make the detailed calculations.

It is also of special interest to note that by the use of the proper chemical manures good crops of grass have been rendered possible immediately, even on this very exhausted and maltreated land, in which respect the results stand in marked contrast to those with Indian corn and potatoes.

It is hoped that the presentation of this matter, which has of necessity been brought together hurriedly, will offer encouragement to greater system in the growing of crops and in the use of manures.

## SHALL WE REVIVE THE SHEEP INDUSTRY?

BY F. H. BUFFUM.

Ought the sheep industry in New Hampshire to be revived? We say "revived" because it has flourished and it does not flourish. This industry is as old as any industrial life in the commonwealth. We do not say merely that it rests on a secure foundation; it was *wrought into* the very foundation itself of the producing activities of our colonial life. Just here we may felicitate the farmer upon the supreme dignity of his attitude to the wants of society. Most purveyors to the multitudinous demands of today are ministering to manufactured wants, supplying that which is not essential to a vigorous and comfortable life. The sheep farmer meets the two fundamental wants of our people—food and clothing. His market was created when man was created.

In urging the proposition that sheep farming should be revived at once in this state, we will not be diverted by any theories, speculations or visionary schemes. Our task is sim-

ply to let the facts speak to you. Our discussion may be simplified by ignoring two vexatious and much-mooted questions: the relation of the tariff on wool to the sheep industry in this country, and the relative value of the different breeds of sheep. We will champion neither Cotswolds nor Merinos; neither fine wool nor coarse wool. No matter for any choice here, so far as our topic carries. The plea for this industry does not turn on the yield, the quality nor the price of wool. If sheep had no wool still their culture would be the most profitable venture for a New England farmer.

Any signal success in New Hampshire farming is bound up with sheep husbandry. We have referred to it as wrought into the foundations of our productive energies. The sheep was peculiarly prominent in the New England colonies from their very inception. One of the first essays in production by the New Hampshire colonists was sheep raising, and numerous and valuable flocks followed swiftly every founding of a settlement. In 1642 there were more than one thousand sheep folded in the immediate vicinage of Boston.

In Massachusetts, in 1654, the penalty for exporting a ewe was five pounds, and not long after this a competent observer wrote: "Sheep form one of the greatest objects of the farmer's attention and one of his surest sources of profit." Beyond dispute the prosperity of the New England colonial life was built up largely on the sheep industry. The man of all others to first improve the breed of native sheep was George Washington, and immediately after the Revolution he returned with enthusiasm to sheep culture, having flocks numbering seven hundred and eight hundred. At that time the average New England farmer had from fifteen to twenty sheep. Thomas Jefferson was so impressed by the contribution of the sheep to the farm remuneration that he concluded to "push the number of sheep" on his own plantation, acknowledging that he "had never before considered with due attention the profit from that animal." Another president, James Madison, was so enamoured of the sheep that he was inaugurated in a suit made wholly from homespun wool. In

this connection it is pleasant to recall that the first assertion of colonial independence was made through the sheep, the sturdy New Englanders making ready for the inevitable by increasing their flocks to feed domestic manufacturers, thus rendering the colonies independent of the English looms.

That this was a sore affliction to the mother country appears in her retaliatory enactments after the peace of 1783. She imposed the severest penalties of both fine and imprisonment upon the exportation of any sheep and upon the allowing of any machine or parts of machines useful in the manufacture of any sort of textile goods. For the putting on board of any vessel for exportation any tool or machine for this use a fine of one thousand dollars and twelve months' imprisonment was the penalty. Of course, this imposition was quite futile in its results.

From the earliest days it was recognized that New Hampshire possessed peculiar advantages to the sheep industry, and Vermont got her first and most powerful impulse toward wool profits from the eastern banks of the Connecticut. In the first years of the last century sheep were notable in the productions of western New Hampshire. Dr. Parkhurst had a fine flock of Humphreys, and William Jarvis gathered a larger flock of Merinos. From 1810 to 1840, Leonard Jarvis maintained a notable flock, ranging from one thousand to two thousand five hundred head. He was a diligent breeder of several varieties of fine wool sheep. For thirty years he kept separate and pure two of the finest varieties of sheep known in this country. In 1830 Grant and Jennison of Walpole started a Saxon flock, which was kept up for years, a pure strain. In 1811 some Guadeloupe sheep were imported to New Hampshire; were soon controlled by the Enfield Shakers, and the flock was held intact until 1844. The finest cloth in New England was made from this wool. The Lebanon Shakers also won a high reputation for results achieved with these sheep. From 1848 to 1854 J. N. Sawyer of Salisbury was noted for a splendid flock of pure-bred Guadeloupes.

"In 1835 the raising of wool was fast becoming the business of New Hampshire landowners, to which their productive meadows and fine pasturages contributed." Mr. Jennison of Walpole had 370 sheep; Mr. Hodskin of Walpole had 800; Mr. Stevens of Claremont had 300. But the fluctuations in this industry have been phenomenal, and quite unaccountable, if you concede the farmer to be a shrewd business man. After 1840 the industry declined for quite a decade and then revived, but mutton came to the fore and wool was secondary. Pity indeed that this supremacy was not maintained, for wool is emphatically the lesser part of a sheep. In 1861 the see-saw tilted and mutton went to the shelf while wool raising was largely profitable. But in 1866 wool growing rapidly declined, and when wool went the sheep went. In 1865 there were, in New Hampshire, 677,000 sheep. In 1880 the number had fallen to 212,000. In 1890 there were not more than 192,000 sheep in New Hampshire. Following the great depression there were determined breeders who nobly persisted. This was well illustrated in the Merrimack valley. The Melvin flock has been perpetuated, while Mr. Pearson of Webster did good work in his Melvin cross.

The farmers of New Hampshire made a colossal mistake, because of their inability or disinclination to meet "new occasions with new duties" and adapt their energies to changed conditions and demands. Let us ponder two illustrative facts: the city of New Haven, in a certain period consumed 12,000 sheep, but Connecticut produced only 250 of this number. In one year the city of Boston consumed 538,000 sheep, while only 9,000 of these were raised in Massachusetts. The trouble was and is that the farmer has pivoted the whole sheep industry on the yield and price of wool. There is need of big emphasis upon the fact that the profits in sheep do not depend upon wool. The wool industry has changed marvelously, but the sheep—in its vital relation to farm prosperity—has not changed one iota. Take two facts, a century apart: in 1794 the Massachusetts Agricultural Society officially declared that "sheep form one of the surest sources

of the farmer's profit." Now, one hundred years later, glance at the Bowditch farm, in Framingham; a flock of 600, with careful statistics, profits running from 40 to 60 percent. Another case: in 1890, a Vermont farmer with 100 ewes, averaging 100 pounds weight, yielded a profit in one year of \$207.75. My father and my grandfather made more money from their sheep than from any other line of effort. Mr. W. W. Ball of Winchester persists in the sheep industry and is successful today. It is common for him to bring an April lamb up to ninety pounds in September, and when lambs of twelve and fourteen weeks will bring from five dollars to eight dollars how can the farmer hesitate? In the city of Manchester, only last winter, there was such a dearth of mutton that orders could not be filled.

There are four important factors in the sheep industry. First comes the improvement of the pastures. Says a high authority: "There is a growing sentiment among intelligent farmers that keeping sheep for the good they do the soil is becoming a necessity; that the soils of New England can be kept up only by the plan pursued in old England, an advanced system of sheep husbandry and agriculture." Second, the sale of early lambs; third, the sale of yearling lambs and fat ewes; fourth, the sale of wool. What most farmers have counted as of first consideration is really the last.

We now come to the source of the panic that has stampered the farmer and banished the sheep—the dog. And it is the farmer's own fault. In the General Court of 1907 I viewed with amazement the performances of some farmer members. I never witnessed ranker and more inexcusable selfishness. A good bill, simply requiring that owners of dogs should restrain their property as the farmer has to restrain his stock that may wander, was before the house on a unanimously favorable report. And it was the farmers who killed it—dairy farmers who kept pet dogs and wanted those dogs to have liberty to rove and roam. The lawyers did nobly, and the killing of the sheep raisers' hopes cannot be



laid to them. We lost the bill by one vote, and the active opposition of farmers killed it.

We can defy the dog. We can put up five or six-feet wire fences which will bar the dogs, and it will pay to do it. But here is an onerous and outrageous tax upon the farmer for the benefit of the pet-dog man, who wants his animal to have rights which no one would dream of asking for any other domestic animal. Yet, despite the obstacles, which seem to have paralyzed the sheep grower, let him know that our fathers battled with identical foes—and won out. In 1648 the General Court set up this ordinance: “Forasmuch as the keeping of sheep tendeth to the good and benefit of the country—if any dog shall kill any sheep the owner shall either hang his dog forthwith or pay double damages for the sheep. If the dog hath been seen to course or bite any sheep before, not being set on, his owner shall both hang his dog and pay for the sheep.”

There is a call to the farmer, louder, more strenuous than any challenge which waked the echoes of our hills before. The farmer should open his eyes to the world as it is today. He is in the swirl of forces that he cannot sneer away. Why not render them subservient to his larger supremacy? An eminent industrial king asserts: “The control of horse power is the control of life.” Let us put up the immovable bar right across the path of such a purpose. The franchise value of a horse power has been reckoned at twenty dollars, but a sheep power and its franchise holder cannot be held within that value. Let the capitalists, let the combiners and the monopolists, hear from the farmer, who, holding sheep, holds the key to prosperity; and let all men take notice that the prosperity of the farmer is the life of the people.

We have a right to all needful protection in a universally beneficent industry. Our last plea shall be in the words of high governmental authority: “No substantial progress can be hoped for in the sheep industry until such time as the sheep is accounted better than the dog; and the people, and the powers that govern the state, realize the fact that its fer-

tile lands will not remain fertile forever under a system of agriculture that is exhausting them year by year, and until they realize that as a conservator of fertility and a renovator of the soil the sheep has no equal."

## AGRICULTURAL DEVELOPMENT.

BY W. T. BILLINGS.

"We never miss the water till the well runs dry"; we never appreciate our opportunities to the full until they are fading away in the beyond; we seldom realize the blessings of good health except when the doctor shakes his head dubiously and digs some terror-inspiring tablets from his medicine case—that is, most of us.

When we do begin to recognize a condition of lessened advantages, it is time to wake up, if we are to profit by the lessons of experience. If we let the well run dry the second time, we must expect to go thirsty; if any more opportunities come drifting by, no one should bemoan his fate if he fails to grasp them firmly and hold to them steadfastly; if, after the doctor tones us up, we neglect to follow his advice, we have no right to mourn at the vision of an early grave.

All this applies to developing the state of New Hampshire. It may sound pessimistic, and, perhaps, that is of temporary benefit, but, when we arise to the occasion and appreciate the fact that we must get to work, there can be nothing but the brightest kind of optimism in the air; it must envelop all about us, our cause and our work and our results.

Since the period immediately subsequent to the Civil War there has been a gradual but persistent decrease in the amount of tillage, value of production, and market price of agricultural properties in New Hampshire, and, while this was offset to some extent by the increased demand for summer homes, the general effect has been retrogressive. During the latter portion of this period of farming decrease, the rise in the price of foodstuffs has been rapid. Northern New

England was once an important factor in raising nearly all the products which have increased in prices, and it supplied to a large extent the markets of the northeastern part of the country. There are those who believe that the lessened production has had a part in enhancing the valuation of the food supply. However that may be, and whether or not the increase in the cost of living is due to smaller supplies and greater demands or to the avarice of hydra-headed trusts, as it is often asserted, it is a generally accepted principle that it is not well for a community to permit its products of agriculture lessen in amount if use may be found for what can be grown.

That is the general proposition with which I have to deal this evening, that New England has produced more, can produce more, and should produce more. It is true that agricultural conditions have changed, but that is true of all other conditions in our daily life, and it is not at all unlikely that these changes will continue for many generations; but success in any calling at any time and in any location depends on meeting those conditions as they occur and taking advantage of them as they are found.

I am a son of New England, but New Hampshire is my adopted home, and I acknowledge to every native of the state the graciousness of the welcome that has been accorded me. I believe in the future of the whole state and the whole section, for what it can do, as well as what it has done. A few years ago, during a journey from Chicago to Boston, the train rolled through a corner of Vermont just after breakfast. In the smoking compartment was a gentleman from Missouri, who had informed me that he was on his way to secure Boston capital for a real estate transaction in his state. Glancing out of the window toward some pine-crowned hills in the near distance, he remarked sneeringly, "Why, look at those rocks and hills of your New England. We have nothing like that in Missouri; it is almost entirely rich prairie land."

"Confound you, sir," said I, "if it had not been for these rocks and hills of New England you never would have had your state of Missouri."

That declaration may have been somewhat exaggerative, but the underlying principle is true. I need not tell you of New England's share in developing the nation, but I do want to refer to the fact that it was the soil and water and air of this section which made the man who had so large a part in the progress of this country. In view of what it has done, we know it can go as far in improving the conditions for those who now live here, provided advantage is taken of the many opportunities which have been vouchsafed us.

There may be difficulties to overcome—where are there not difficulties? In 1904 I happened to visit the Nez Perces Indian reservation in the state of Washington, just previous to the death of Chief Joseph, and on the way there, at a point where we were ferried across the Columbia river, I saw one of the most productive fruit orchards it has ever been my fortune to view. It was charmingly located, the peacock blue of the swiftly flowing stream and the dark brown of the precipitous coulees affording a picturesque setting for the deep green of the foliage. The comfortable residence and the commodious outbuildings seemed so much a part of the picture of Nature's generosity that I congratulated the proprietor on finding such a fertile and profitable spot. "It is pretty," he said, "but I had to ferry people for a good many years before I got money enough to develop this irrigation proposition, and I wish now it was a little nearer to markets, because freighting is expensive."

Thus I learned that he, too, had had difficulties to surmount, that his prolific orchard and his pleasant home were all man-made, in the sense that he was compelled to utilize Nature's forces and turn them to his bidding before he found a comfortable living and changed the character of that particular portion of the landscape.

As he irrigated, so it is necessary in New England to fertilize; and one undertaking is no more serious or expensive than the other. Here we have the water and can secure the richness of the soil, just as the orchardist of the Columbia river had the fertile land, but was compelled to find a way to control his supply of water.

So these conditions are equal, but in New England there is one supreme advantage that my friend of the Northwest does not enjoy. Before he can get his fruit to market it has to be conveyed by stage nearly forty miles, over roads clouded with alkali dust, to the nearest railroad station, and from there it is sent ninety miles by train to the city of Spokane. Where in New England is it necessary to struggle against such a disadvantage as that?—why should the men of this section hesitate to raise fruit when such pioneers as he overcome obstacles and get their goods to the consumer at a profit?

As distance lends enchantment to the view, so it minimizes the difficulties which confront everyone who strives to go forward in life. Only a few weeks ago, one of the most erudite judges of the Supreme Court of New Hampshire reminiscently remarked to me that he sometimes wished he was a young man again so he could strike out into the West without a cent beyond his carfare, take up a homestead area and develop a paying farm and comfortable home.

He was enshrouded by the glamour of the West, and distance had minimized the hardships before a young man who undertakes such a mission. He had not considered secluding himself miles from human habitations, without the consolation of companionship, the solace of liberty, the comforts of a church or the refining and uplifting influences of good men and women. I asked him if he thought he would enjoy living in a sod hut (he did not stop to think of the difficulty of getting timber or brick for a habitation) and if he could stand eating bacon and salt pork and flour flapjacks day in and day out, until after two years or more of the utmost desolation and discomfort he might have sufficient money to improve his condition.

“Why, for the price of the carfare,” I told him, “you could get in New England an interest in an excellent farm property, near to profitable markets and comfortable conditions of living, with fully as good a chance, if not a better, to develop to extensive agricultural operations.”



But the glamour of distance held sway. He thought the young man who went West had better opportunities than the one who remained at home. If that is true, then I assert that the western young man has better chances if he comes East than if he remains near the surroundings of his boyhood. Environment, doubtless, has much to do with a man's future, but when it comes to making a competence from the soil New England need not, should not, and will not take second place in rank with any western prairie remote from civilization.

Here is one of the points which goes to prove my contention: the freight rate on the production of an acre of corn protects the New England grower to the extent of ten dollars per acre. A professor in the University of Maine told me the other day that it cost the New England grower two dollars more to produce an acre of corn than it does the man on the extensive fields of Kansas and Nebraska, with everything considered. Therefore, for corn used in this section of the country the New England grower can secure eight dollars per acre more than the farmer who raises it in one of those western states.

Those are hard-pan figures and they are supported by the census report of 1900, which gives to New Hampshire the record of the greatest yield per acre of corn of any state in the nation.

Why, then, is not corn produced more extensively in this corner of the country? In answer I can only offer a theory, and I doubt if a Philadelphia lawyer could do more. It is that New Hampshire and New England have forsaken the habit of raising corn. Not many years ago, when land was low in the West and high in the East, it probably was true that this eight dollars per acre differential did not exist; the western producer enjoyed advantages over his eastern brethren for which even freight rates could not compensate. The old order changeth. The westerner then raised corn on the land which the government was willing to give him if he would establish his home there; today much of that land is

worth one hundred dollars per acre. The farms of New England were producing diversified crops, which provided a good family living, and the feed from the low-priced western farms was sold in Boston cheaper than the New England farmers could afford to raise it. I do not wonder that the eastern men stopped growing it. You and I would do the same. But, as the irresistible worker of destiny continued on his cycle of development, the New England farmers lost a lap on the course and neglected to pick up the lines which they dropped when it seemed that the West was going ahead of them. They have not recognized the change in conditions, and, despite the fact that it will pay them to do so today, they have not yet begun to raise corn extensively again. Until they do, you will see the price of milk, butter, cheese, eggs, beef, poultry, pork, lamb, and mutton continue to rise, and all the boycotts and agitations and arguments devised, suggested or arranged from the time of the birth of Adam to the final resonant reverberations from the horn of Gabriel, will not make it otherwise. The relief from the high cost of living, or the cost of high living, whichever way you want it, must come from the development of agriculture, and, for the relief of us right here in the northeast corner of the dominion of Uncle Sam that development must be of New England soil. And I do not need the presence of our old friend, Bill Jones, to prove it.

The process of the development of a state or section is not unlike the growth of a lad well endowed in body and mind. No matter how strong physically or how able mentally he may be, it is impossible for him to reach the proper proportion of improvement through his own efforts. He may grow in size without advice or lessons of experience, but he will not know how to utilize his strength and ability to the best advantage unless those of experience guide and direct him. And the development and growth of a great state must be guided and directed on the same principle; those who have its interests at heart and who would see it triumph and come into those things which are its own must chart the course to be followed

and keep steady hand and true eye that no disasters arise to interfere with the march toward the goal of progress.

Who must those counselors be? Every man in this audience should help in the work. No one can do it alone or unaided, and neither is there one so low or so high that his efforts will not be of some avail. It is a work for everybody, and, if we seek to attain the best results, all must pull together, as all will share the reward together.

You all know the story of apples. Men in the far West learned how to cultivate, spray, and pack the fruit, in the exercise of the highest degree of skill. The result of their study and labor was the production of an apple which heretofore never had been seen. In appearance and marketable value it was far beyond anything ever raised in New England; yet they could not transplant the flavor of our apples to their magnificent irrigated orchards. They might improve the looks, but they found that the beauty of their product was only skin deep. Then it was that people appreciated the kindness of Nature to this section. That kindness must be taken advantage of. We can and must grow, and have grown, apples as handsome as those of Idaho and Oregon, and then, with the New England flavor, we can beat the world, and drive the western interlopers from the field.

Another kindly gift of Nature has been the magnificent scenery and delightful climate given New Hampshire. They bring every summer to our confines thousands and thousands of vacationists seeking respite from the discomforts of heat-laden and breezeless centers of population in other parts of the country. Their annual visit means millions of dollars to our people, but the sojourners constantly are calling for more and more of the products of our farms, our fresh eggs, our pure milk and butter, our fruits and our vegetables, and there is room for an enormous increase in the supply to be offered them, in providing which the farmers have an opportunity to add to their store of wealth. The summer resort business is truly a great blessing, but as yet there is only half the advantage taken of it that there might be, and it

behooves every one of us to develop that field of effort to the utmost limit.

There are numerous problems to solve. One of the most important is that of properly packing your products and marketing to the best advantage. This problem is not unique in this section. It has prevailed in every part of the nation where the farmers have sought a living. It has been solved in every instance by coöperative shipping associations. I have had considerable correspondence with officials of these organizations in New Jersey and Long Island, and I intend to visit those places during April and make a thorough study of the methods and operations in vogue. When I return I want to be thoroughly equipped to tell the farmers of New England how success has been found by following this plan.

In passing, I want to refer to one advantageous opening hereabouts. It is the production of strawberries. As yet, hardly enough is raised to supply the local demands of nearby cities. There is room here for enormous development. Besides the New England centers, there is a strong and ever growing demand for New England strawberries in New York, Philadelphia, Baltimore, Washington, and other cities after their local supplies are consumed. New Hampshire could and should raise strawberries to ship to all those centers in sufficient amounts to require refrigerator car service, and it could be done year after year with very satisfactory profits, to say nothing of providing the quick cash product which so many of our growers require.

We are here to tell the world about New Hampshire, and, also, to tell the people about their own state. There is no occasion to bemoan your inability to strike out into new pastures and begin life over in other fields. Look around New Hampshire and study its possibilities. Any man who begins to do this will find himself greatly surprised in the course of a few months. There are better than gold mines in the agricultural possibilities, and, once those are properly developed, we will have thousands and thousands of horse power in water privileges harnessed for manufacturing advancement. I doubt if any man here will live to see the highest

development recorded for New Hampshire, because there are so many latent possibilities, so much to start with, so much to progress with; and they are not confined to any one thing. They extend to nearly every department in the field of agriculture and to many branches in manufacturing lines. We may, if we will, see the beginning of the development; but the completion is for other ears and eyes and hands.

This coming progress is a conquest of peace; but to carry it on we need men like those who fought their way into the wilderness in colonial days; like those of intrepid spirit who successfully struggled for their own independence and gave us ours; like the sturdy souls who wrested an empire of the west from unappreciated possessors; like the self-sacrificing heroes who were not awed by death in holding to the principle that the Union should not be severed. You know of those conquests well and you know of the men of achievement. You know where they came from and what made them. The country needs more men like them, and they are coming from the same farms of New Hampshire and other New England states that sent them before. They came in 1776, in 1812, in 1847, in 1861, and in 1898, and, if they responded in time of war, you may be sure they will not shirk the front in times of peace.

In this conquest of peace the railroad is but the assistant of the people. You may call it a selfish interest if you will, but all the great movements the world has seen have been inspired by a motive bearing on personal advantage or benefit. You may say that the railroad wants the agricultural and industrial interests of New Hampshire developed in order to increase the amount of transportation receipts. Such a reason might be technically and narrowly correct, but the definite and important purpose goes much further.

The whole reason is that a railroad's prosperity extends beyond a mere growth of freight and passenger traffic. It rests mainly on prosperous and progressive communities, with citizens alive to opportunities and alert to take advantage of whatever honorable means may appear. Men should



feel that there is something ahead of them; that they can, by constant and reasonable effort, find what they want, with room left for ambition, and yet give newcomers plenty of chances to make a start. It is not profitable to a railroad to have a general opinion prevail that the best has been secured from a community; that what remains is suitable for a mere hand-to-mouth existence. Rather, the sentiment should exist overwhelmingly that only the half has been accomplished, and that in arranging for the future the best results will accrue.

So, in the industrial work of the Boston & Maine Railroad the main effort is to stimulate ambition and increase comforts through additional activity. The direct results of the work in the way of larger transportation demands will not be seen for years, but full value is found today wherever there may be a community which is aroused to greater effort or wherever a handful of men is encouraged to go forward in the lines of progress. The profitable return is wholly in the future, but there is a heightened valuation in the present when the people are spurred on to make more of themselves and improve their surroundings, just as a dozen apple trees set in a pasture make a farm worth more year by year, although the direct return from the fruit is a matter of nearly a decade.

Most important of anything in the accomplishment of results is the coöperation of the people. In the great work of bringing about the development of New Hampshire there should be a mutual shouldering of the wheel. The best method to achieve success is for the railroad to begin the task and the people continue it—let the railroad start the work and the people push it along. The faith of the people of New Hampshire must be shown by their works, else how can proof be offered that here lie the opportunities for men to secure a comfortable and healthful living for themselves and their families, with a competence laid by to make the pathway of old age cheerful and easy.

These things we know—and by a united effort we should demonstrate their truth.

## WHAT OF THE CORN CROP AND HOW TO IMPROVE IT.

BY DR. G. M. TWITCHELL, AUBURN, ME.

It is a familiar phrase running through all agricultural literature that success in agriculture rests upon successful stock husbandry, yet the lesson of the century is so imperfectly accepted and appreciated that there is today urgent need for its being emphasized over and over again. At the same time we must not overlook the fact that success in stock husbandry rests upon the ability of the individual owner to produce in largest measure the feedstuff for his animals, having always in mind the maximum growth or product and the minimum of cost or waste to the farm. The day has come when we must accept as sound doctrine that the one thing to be sought is reduced cost of production rather than a higher price for our products. Granting that this is not an attractive field for speculation, yet upon this rock must the work of future years be grounded, and to its importance individual attention directed. Detracting nothing from the necessity for coöperation in disposal of farm products and the increased benefits sure to follow any well-organized, consecutive movement, the lesson still remains, and will remain, that he only who critically counts the cost of production is sure of standing ground in the financial field. The greatest check upon Maine farm development has been the assumption on the part of so many that feedingstuff could be purchased cheaper than it could be produced. This spirit of dependence upon the western grain store has been a positive block in the pathway of progress. That condition *must* be broken before there can be that spirit of enthusiasm permeating our rural sections which will attract young people to the farm. It is not that individuals are not able to realize in spite of the burden of grain bills, but that the unconscious influence of this practice checks the promotion of the industry. When the impression is made that a finished product is possible only

by the use of raw material brought from a distance the effect is to divert attention towards the seat of production of that raw material. If in the case of our stock husbandry this has been necessary, we could face the situation and prepare to do the best that is possible, but it is not, except in the case of a restricted amount of feedingstuff. Better knowledge of food elements, the valuable demonstrations by scientific investigators, and the low price of western feedingstuff in the past have combined to turn attention away from New England farms, but with this knowledge, coupled with the demonstrations and backed by the fact that the day for low prices of western grain has passed, never to return, the lesson presents itself in different form. New England farms *can* and *must* produce in larger degree the feedingstuff wanted for the perfecting of any stock or making of any product. Deny this proposition and you bar the further progress of our agriculture; admit its truth and the lesson is self-evident. If the development of agriculture rests upon stock husbandry or milk production, success in stock growing can be insured only through increased dependence upon the home-grown crops, corn, next to grass, being our chief reliance.

Very close to the heart of this problem of agricultural development, so important to the state and the nation, lies this question of the corn fields. Upon the success of the corn crop in New England, more than any other, rests the future of the industry, for nowhere does the flint corn perfect itself more completely than here, and nowhere is greater yield per acre possible.

Sixty bushels of shelled corn per acre is far and away beyond the yield of the corn belt of the West, but not the limit on New Hampshire fields. There is great danger today that public attention may be diverted from this to other profitable cash crops and its place in a complete system of rotation overlooked. So much for underlying facts. What, then, of the crop? I regret that no reliable statistics are available as to the value of this crop to the state, so large a

percent being in the stalks, and so many farmers utilizing the whole by means of the silo. If adequate figures could be given they would but suggest the possibilities when fully appreciated. One fact is well established, that neither by the common methods of selection of seed nor growing the crop can its greatest value be insured. One lesson bears heavily upon every producer today, no matter where his field of labor, that there can be no profit in half a crop. It is the maximum of output per acre or machine which pays, provided the minimum cost of expenditure has faithfully been sought. No man can fix the limit of production with acre or animal, and until that is finally determined the whole problem forces itself upon the critical attention of him who seeks for profit. In every industry the possible percent is reduced by failure to intelligently apply well-known business principles.

Whether intended for the silo or not, there must be the certainty of full maturity for the crop to command full attention. Beyond that, the question of yield forces itself year by year, more and more, upon the student. We want a corn of great vitality, giving a strong, stout, vigorous stock of reasonable height, maturing in one hundred days, one if not two ears to a stalk, twelve to fourteen inches in length, well filled to the tip. What does this mean? If an acre of corn is planted in drills three and one half feet apart and the seed dropped nine inches apart in the drill there will be sixteen thousand five hundred and ninety-four stalks, assuming that every kernel germinates. Allowing one ear to a stalk and six ounces of shelled corn per ear, the average with eight-inch ears, and the yield would be one hundred and four bushels of shelled corn per acre. If the ears be increased to ten inches, the yield would be one hundred and fifteen and two thirds bushels. Is such a crop possible, and, if so, how? The whole problem revolves about this center of seed selection and seed vitality.

With these facts before us, it may not be out of place to emphasize well-recognized facts underlying successful corn production. Fortunately, the hillsides of New Hampshire,

lying in the corn belt, are peculiarly adapted to the crop and the soil, whether of a clay loam or rocky formation, calling only for thorough preparation to do its best. That thoroughness may well be emphasized, as the radical changes in farm machinery are likely, unless guarded, to lead to superficial preparation for cropping. Not alone the releasing of plant food, but that deep stirring of the soil, to admit air and sunlight, become necessary when full crops are desired.

The more thorough the work in the beginning, the greater the harvest. Those who criticize what they claim extravagant claims are usually those who gloss over their work. A smooth surface may not indicate a well-worked field. A full crop requires a hearty meal every day until perfected, and no man can afford to stint his corn field when fertilizing. Not how little will answer, but how much will be profitable must be the rule. Everywhere those who grow the largest crops are the most liberal, and, at the same time, most intelligent feeders. No man can be satisfied with a yield of fifty bushels to the acre. The line of profit is above, and it must be found, and complete fertilization is as necessary as thorough cultivation.

The seed must be that which for years has been grown under the eye of a painstaking man, taken from the most vigorous stalks, thoroughly cured, and when shelled saved from the center of the ears, leaving at least one inch of tip and butt. The average corn crop of the country is placed at 24.2 bushels per acre, not because more cannot be produced, but because men will not meet their part of the contract. In one experiment seventeen bushels of fine ears were selected from good stalks just after ripening. After a closer examination of these ears and the testing and measuring of a few kernels from each, enough very choice ears were selected and used the next spring to plant ten acres in the corner of a sixty-three-acres field. The remaining fifty-three acres were planted with the remaining best ears of the seventeen bushels. Other similar fields surrounding the sixty-three acres were planted in the same manner with seed taken



in accordance with the usual custom on that farm, from the cribs in which the best corn had been placed the previous fall. All the fields were given the same treatment.

The ten acres yielded ninety-six bushels per acre; the remaining fifty-three acres of the field, ninety-four bushels; and the other fields eighty bushels per acre. This shows an increase of sixteen bushels per acre in favor of ears selected for a single season with much care from good stalks, as compared with seed ears selected in the spring from a crib. When continued year after year, the well-selected seed increases in superiority over that taken from the crib. What, then, would have been the increase had the seed been marked in the field from the strong hills and best developed ears?

I have seen men dip their seed corn from the bins, pick their potatoes from the pile in the cellar, and select their cows by the one standard of pedigree, but I have yet to find one of this class making a permanent success. Critical seed selection alone can prevent seed deterioration, and only the honor of the seedsmen saves from disaster those who do not and will not protect themselves.

One who is reckoned a good farmer last spring purchased a lot of sweet corn saved for seed by a neighbor, ran the whole through his corn sheller and planted ten acres for the factory. If he was satisfied with the yield what might it not have been had he taken time to select his seed and then used only from the center of the ears. His field, while looking well from a distance, disclosed a large percent of shorter and weaker stalks upon close inspection. This is not to be the business standard of 1909. For ensilage purposes the stalk should be rich, succulent, leafy, and remain green and tender until the ear has reached considerable development; but if ear corn is the only product desired the qualities of the stalk should be such as will best lead to the full development and support of one or more good ears. The productiveness of the stalk is, of course, the point of most importance.

A stalk great in circumference near the ground and tapering gradually to the tassel, with sufficient foliage of vigorous

appearance, free from diseases and bearing a good ear or ears at a convenient height, is a desirable stalk from which to select seed. All seed should be tested in early spring to determine its germinating power before being put into the ground. If fully matured, properly cured and handled, practically every kernel will come. This is the experience of those most critical in growing. I was surprised the past season in attempting a little work with yellow corn to see how rapidly it changed when the suckers were cut out, and this I believe to be an important step in profitable corn growing where yield of grain is the objective point, surely when seed is wanted. Not once but thrice at least should every hill marked for seed be visited, and all off-shoots or false shoots be removed. It is the weak stalks which reduce the yield both of stover and mature corn, and to eliminate the largest possible percent of these is both a duty and privilege with the grower. An authority says: "Before the corn comes into tassel, or even earlier, a few rows may exhibit marked weakness. Such rows should have the tassels pulled from all the stalks as soon as they show plainly in the top of the stalks and before pollen is discharged. In the same manner the tassels should be pulled from all the undesirable stalks in all the rows. Undesirable stalks consist of barren stalks, stalks with many suckers, feeble or very slender stalks, smutty stalks, etc. If detasseled in time, the transmission of these characters to the next generation will be prevented."

The one object is to mature the largest quantity of seed, stronger in germinating power than that planted in the spring, and stronger also in power of resistance to possible injurious influences and diseases. To insure this, as well as to hasten complete maturity, every obstruction must be removed. A far too common practice in selecting seed is to save the ears from the largest, stoutest stalks at cutting or husking time, but this will hardly suffice under conditions prevailing today. The tallest stalks do not mature the largest or best formed ears, but those of medium length, stout at the base, and with abundance of broad, well-developed

leaves. Such stalks should be marked, the suckers or false shoots removed, and any tendency to excessive setting of ears checked, the one object being the production of seed likely to increase yield and value of future crops.

To emphasize frequent light cultivation, the removal of all weeds and nonbearing stalks, and the conservation of moisture throughout the season is but to repeat what is urged from every platform, yet the average crop yield of the state, both of yellow dent and sweet corn, is greatly reduced because these homely lessons will not be observed. No man gives too much cultivation, and the great majority far too little. Until thorough work marks every step there is no justice in a criticism against any seemingly extravagant claim. We know not the value of the corn crop to the state of Maine. The corn shock is not the best place to mature seed. Those marked stalks should be topped when the ears begin to glaze and left until well hardened, then the ears plucked and spread in single layers where the air can circulate all about them, and not traced until the cobs are well dried. A damp, mouldy cob will injure the seed value of the kernels. Everywhere it is the same, success hinges upon seemingly trivial details. Trifles make perfection but perfection is no trifle.

Corn breeding, like stock breeding, offers returns not to be obtained in any other way, and if the demands are exacting the results will surely be satisfactory to the critical grower. Corn bred for several years for increased production will produce, with exactly the same treatment, ten, twenty or even forty bushels more per acre than unselected seed. Counting the increase at but ten bushels per acre, when corn is selling at eighty cents per bushel, well-bred seed bears a money value of forty-eight dollars per bushel, and the profit on the corn crop is increased eight dollars for every acre grown. This estimation is very conservative, the profit being often four times as great. The law of reversion holds as tenaciously in corn culture as in stock breeding, and the slightest neglect opens the door to failure. Seed runs out

through neglect; it runs up in proportion as skill is manifested in its growth and care.

This association came into existence because of the conscious need of strengthening our dairy and agricultural interests. Today that need is greater than ten years ago, but it is specifically along the line of encouraging the more thorough testing of individual cows and the increased production of less expensive food products, chief among these being the corn plant. Profitable dairying hinges on the feeding of silage, and to meet conditions certain to arise during every year, and prevent shrinkage of the milk yield the dairymen are coming to feel that they can find profit only by a full year's supply of ensilage. If the experience of the past year has taught any lesson it is that of greater reliance upon the corn crop. Drouths will come and cows will shrink unless the farmer is prepared at all seasons, and the lesson is obvious.

Throughout Central Maine the growing of potatoes is claiming increased attention yearly, and we are learning that the more thorough the cultivation of the land the better for succeeding hay crops; but before that field is seeded there should be grown the corn crop to balance conditions and insure that wealth of plant food for the large hay crop to follow. Every acre must produce more than the labor item may be minimized. The day has gone for a man to mow twenty acres for a ten-acres crop.

I want to enter my plea for more attention to our native yellow corn, so sadly neglected, for where the corn tassels rear their spires and the stalks rustle in the autumn breezes there is sure promise of lasting prosperity. This native product of New England has not yet been developed to its full capacity either in stalk, yield of corn, or food nutrients, and no man dares today to set the limit along either line. In this field of experimentation the live farmer finds the one chief source of satisfaction, for out of the desire for mastery there is sure to follow the determination to know more of the life history of the plant or animal, and, following this, that am-

bition which alone can develop positive, aggressive, well-balanced manhood. No field is more inviting today than that of flint corn production and improvement. It has been a source of great satisfaction to find men in every part of Maine, where the corn crop matures, who have for years been working out the problem, and to learn that in every case they are obtaining results far in advance of their neighbors. From some of these I have secured sample ears, which I assure you it is a pleasure to bring for your inspection.

With these I desire to present the very complete methods of seed selection followed by representative farmers. One grower in eastern Penobscot, Mr. S. T. Mallett, of Carroll, sends sample ears from seed grown by him the past eighteen years, originating in Lee, and selected at husking time, taking the most vigorous ears only, smallest in cob, with kernels of uniform size, the result being a marked increase in size of ear and yield of shelled corn. Here is the evidence of that thoroughness which counts in the case of Mr. B. F. Clark, Kenduskeag, Maine, whose story makes good reading.

"I moved to this farm eleven years ago this month, and the seed from which this corn was raised was here when I came and for many years prior. I can give only ten years of its history under my care. I found the original seed uneven and very much 'zig-zag' on the cob, but very early, so I determined to try and better it by selecting the best and giving good culture. My method in selecting seed is to note the first ears that show on the stalk by marking them and following the marked ears through the season, then at husking time I reject all that do not come up to a certain standard, which standard with me is as follows: First, I select the longest ears with large grains; second, taking care that every row is snug together from tip to butt, allowing no slack spaces between rows at butt; third, I select the smallest cob possible; fourth, I try to have every row straight on the cob; fifth, I want the cob as small as possible where it breaks from the parent stalk. This method I have followed for ten years and if you could have seen the seed I started with you would



be surprised at the change. You will see two or three places on the ear where the kernels are a little crowded. When I shell my seed I reject these seeds if I find any, and when shelling for seed I discard about two inches of the tip; the rest of the ear goes for seed.

"Culture: I like a warm soil well drained, well manured, and well tilled, for then I find no trouble in raising corn. I prefer old ground for corn, but have had good success by planting on sod land. I use about ten cords of stable manure per acre with six hundred pounds of commercial fertilizer in the hill, and start the weeder about the third day after planting, and keep at it once each week until the plant is about three inches high, then I put the spike-tooth cultivator to work and keep them both at work each week until the corn shows signs of spindling. I also use the hand hoe, going over the piece twice during the season.

"To free a field from ravages by crows, take a pair of old pants or overalls and an old coat and hat and make the scarecrow; then take three light poles twelve feet long, tie the top ends together, raise them in the form of a tripod; tie a small cord around the neck of the image, raise it up inside the tripod about six inches from the ground, so that any light breeze will turn it, and the crows will give it a wide berth. It is a good plan to put on a mask under the hat. Two scarecrows are enough for an acre, one near the end on opposite corners; place them on the side of the piece and they will not hinder cultivation."

I might present many more, but these will suffice to indicate a standard of work which insures improvement. Believing firmly that a little encouragement, for a few years, will be followed by a decided increase in acreage devoted to this important crop, I shall be glad to coöperate with this society in promoting that much desired interest, and, if thought best by the officers, continue the prizes for 1909, under the same conditions as in 1908, supplying each contestant with one pint of pedigree seed. This seed was grown by me the past season from seed furnished me by Mr. Winn,

who has for forty years been seeking its improvement. With just fair cultivation and fertilization I obtained a yield at the rate of more than one hundred bushels of shelled corn per acre. In selecting seed for next year only strong, vigorous ears were marked and accepted, from which all suckers and false shoots were removed, and from these one inch of both tips and butts were first shelled for grinding, so that the seed is uniform and represents only the center of the ears. Touching its ability to mature, will say that the ninety-fifth day from planting the husks were dry and the ears stood out clear and well hardened. When well dried in the cob, the average weight was between seven and eight ounces per ear.

I leave this matter in your hands, gentlemen, for such action as may be deemed best by the association, suggesting that if these premiums are not to be continued this association outline a more complete and effective method of reaching the desired result. That result is too important to be neglected, for if by any means the young men on the farms of Maine can have kindled within them a love for stock and crop production and be helped to find the larger results possible through skill and insight, the future of Maine farms will be solved and increasing prosperity assured.

What New Hampshire needs today, in spite of the great progress of the past few years, is more enthusiasm for the farm and a stronger faith in its ability to produce the crops wanted for home consumption. The years are bringing their lesson, and it is one calling for consideration. Certain signs point to a surrender of the dairy and a specializing on other single crops. Just as sure as this becomes general, rural life and conditions will suffer within the next quarter of a century.

Somehow contact with animals balances a man as no crop production can. There is that innate relation which the stock feeder holds towards his animals which gives a quality of mental fibre, a standard of citizenship and an atmosphere in home life never to be obtained by hard work in crop production six months in the year.

God has ordained that animals shall be the companions as well as servants of man, and in diversified agriculture, with stock husbandry as the chief reliance, there has followed and will follow a type of manhood differing materially from that relying upon specialized efforts. Success is not to be measured by dollars and cents, but my mastery first over the realm of nature and later over one's self. Wisely has it been ordered that stock husbandry is at the foundation of permanent success in agriculture, and justly may we claim that true success in stock husbandry is to be found only in fields covered with waving grain and glistening with the ripening corn. Today above all else let us exalt our northern corn crop.

### IMPROVEMENT OF THE MILK SUPPLY.

BY PROF. IVAN C. WELD,

Assistant Dairyman, Dairy Division, Bureau of Animal Industry, U. S. Depart. of Agriculture, Washington, D. C.

The subject to which I invite your attention, "Improvement of the Milk Supply," at once suggests that further improvement is possible and desirable. This being the case, some of the questions involved are:

- 1st. What is the trouble with the present milk supply?
- 2d. How can the milk supply be improved?
- 3d. Who can or will improve it?
- 4th. Is it "worth while" or is there any reward for those whose product finally reaches a higher standard of cleanliness?

The first question may be answered in many ways and by people from every walk of life. Their answers echo and re-echo from city to city, and from one end of the country to the other, and an observing person will often find most convincing evidence that the milk supply as a whole is not all that it should be.

Investigations carried on by the federal government and by numerous state and city departments have brought to our attention conditions which, seemingly, are in a large meas-

ure responsible for the present unsatisfactory condition of the general milk supply.

In one instance 144 samples of milk from dairies and milk delivery wagons and groceries in every section of a city of over three hundred thousand population were examined. In every instance a full pint or quart bottle was secured and taken to the laboratory in the same condition as at time purchased. Some of the bottles were filled from cans of milk at the place of purchase, but most of the milk had been previously bottled and the samples were taken at random from the cases. The samples, therefore, fairly represented the quality of milk received by the people of that city during the period covered by the investigation. The fat showed a variation from less than 2 percent to more than 7 percent (average 4 percent), the solids not fat from less than 7 percent to more than 9 percent (average 8.52 percent). The total solids varied from 9.5 percent to 15.6 percent (average 12.6 percent). The acidity or degree of sourness varied from .141 percent to .284 percent (average .195 percent). The foregoing relates only to the composition of the milk and does not in any way refer to its fitness for food. A further examination of the milk showed every sample to contain a greater or less amount of sediment or undissolved dirt. The amount varied from an exceedingly slight distribution of fine specks to an amount sufficient to blacken the bottom of an ordinary milk bottle.

The number of bacteria in the various samples showed great variation. The results as classified are as follows:

8 samples contained from	2,200 to	10,000
10    "           "       "	10,000 to	25,000
23    "           "       "	25,000 to	50,000
18    "           "       "	50,000 to	100,000
33    "           "       "	100,000 to	200,000
21    "           "       "	200,000 to	500,000
6     "           "       "	500,000 to	1,000,000
26    "           "       "	1,000,000 to	12,800,000

Highest count .....	12,800,000
Lowest count .....	2,200
Average count .....	941,000

Many of the samples contained gasforming bacteria in large numbers. In some cases the flavor or taste of the milk was not greatly affected. In others the taste was materially changed and decidedly disagreeable.

That the facts and figures presented regarding the milk supply in the city above referred to could be duplicated in scores of cities of similar size will not for a moment be doubted by anyone familiar with conditions. That such a condition should exist in the milk supply of any city is deplorable, and it could not exist but for the fact that consumers of milk are, as a rule, ignorant of the source of their supply and the conditions under which it is produced and distributed. Unlike most farm products, milk cannot be judged by appearance alone, and the only practical way in which a city consumer of milk may be helped in securing a good supply is through the medium of a proper milk standard and systematic inspection. It is also important that the sources of the milk supply be guarded, and this movement has been undertaken by many of the more prominent progressive cities throughout the country. The widely varying conditions under which milk is produced and handled is shown by one investigation as follows: two hundred dairy farms in a dozen states were inspected and rated according to modern standards of dairy sanitation. Out of the 200 places inspected the highest scoring dairy was entitled to 99.8 points out of a possible hundred. The lowest scoring dairy was entitled to only 9.58 points. The average score of the entire 200 places inspected was 39.04 points out of a possible 100 as perfection.

So far as the eye could determine, the dairy cattle have, with but few exceptions, been found to be in fairly good condition. Their condition as regards tuberculosis is not known except on about thirty farms, where the tuberculin



test is intelligently and systematically used. Ten of the 200 stables contained 4 square feet of window space for each cow stall and received the highest possible rating for that item. Eight of the 200 stables had from 3 to 4 square feet of glass; 30 had 2 to 3 square feet; 48 had from 1 to 2 square feet; 60 had somewhat less than 1 square foot of glass per cow, and 44 of the 200 stables inspected were entirely without windows or light except as it might come from open doors or loosely constructed stable walls. Seventy of the 200 stables have no movable windows; 118 stables have movable windows, but only 12 of the 200 have a good, automatic, ventilating system. Twenty-four of the stables have tight, sound floors. In other cases, floors are slightly imperfect, loosely constructed, decayed, or entirely lacking. In at least 100 of the 200 stables inspected animals other than cattle are kept in the same stable. Horses and cattle are frequently found together, and fowls of various kinds also help to make some places unclean. Seventy-one of the 200 stables have from 500 to 1,000 cubic feet of air space for each stall and receive a full score. On 95 of the 200 farms, all manure is regularly removed 30 feet or more away from the stable. Fourteen dairies out of the 200 are using small-top pails for milking and also 8 out of the 200 provide clean outside clothing for the men when milking.

An examination of the milkpails, can, and strainers used on the 200 farms make clear the fact that these things are often not so *clean* as the people using them *imagine* them to be. Traces of old milk were found in many seams and covers, and in only 58 places could all milk utensils be pronounced superficially clean, that is, thoroughly washed and scalded, and given a full score for that condition. On 95 of the 200 farms some attempt was made to clean the cow's udder, or the milker's hands, or both, previous to milking. Milk coolers were found in use on 48 farms. In but 39 instances, however, was the milk actually cooled to a temperature below 60 degrees. Not over ten thermometers were found in use on the 200 farms, and in at least 195 instances

out of 200 *positive knowledge regarding temperature of milk could not be obtained except by the use of the investigator's own thermometer.* In 40 instances the milk was stored at a temperature below 50 degrees F., previous to delivery, and in 34 places ice was used in transportation or in delivering milk to consumers.

On 126 of the 200 dairy farms there were found separate special rooms or buildings in which to care for the milk. This feature was entirely lacking on the other farms where the milk, in some instances, was handled and kept in the stable, dooryard, cellar, or some part of the dairyman's house.

Bad as it may seem, the foregoing explains only in part the cause of the present movement for a cleaner, better milk supply. Another thing to be considered and included in an answer to the first question is the equipment and the methods employed by proprietors or managers of city milk plants. These distributing plants in many cases buy their entire supply from the farmers and in turn distribute the product to city consumers.

A recent and thorough inspection of 22 such places in a dozen states has shown that here, too, the equipment and methods commonly employed in handling and distributing milk in cities are sometimes far from being what they should be. Of the 22 places inspected, the one scoring highest was entitled to 60.3 out of a possible 100. The poorest place was not entitled to a single point. The average score of the 22 places was 28.66 points, or about 7.5 points lower than the average score of the 91 dairy farms. In some cases the equipment for receiving and distributing milk has been little better than a shed, a tank, and a horse and wagon. Cans, bottles, and measures are frequently washed in the proprietor's kitchen, and it is sometimes impossible to tell where family affairs end and the milk distributing business commences.

A review of the cold facts and figures here given in answer to the question, "What is the trouble with the present milk

supply?" might prove discouraging were it not for the fact that some evidence of improvement along some one or more lines is found on nearly every farm and in many city distributing plants. Furthermore, there seems to be a very commendable desire on the part of the better element who are engaged in the production and distribution of milk and cream to improve their present equipment, and to make use of better methods just as fast as the need for them is clearly seen and understood.

The second question, "How can the milk supply be improved?" and the third, "Who can or will improve it?" are questions that are already being answered in many places. These questions are being answered by dairy papers, dairy officials, and by milk producers and milk dealers whose actions speak louder and more eloquently than words. Even one who spends much time in traveling among dairymen can hardly comprehend the changes and improvements that have been made and are now being made by milk producers in all parts of the country. We are all gradually coming to more clearly understand the true meaning of *cleanliness* in its relation to the dairy industry.

Those dairymen who read dairy papers and attend institutes and meetings where matters pertaining to their business are discussed are usually pioneers and leaders in the movement for cleanliness in their own localities and their influence is great and good.

There is, unfortunately, a much larger number of producers and distributors of dairy products who do not read dairy literature and do not leave their places of business to search for new ideas. These producers and others can only be reached by dairy inspectors. Through some form of dairy inspection these people must be *made* to see the better way and to improve their conditions. That form of inspection, therefore, will be of greatest service that goes most thoroughly into details and most clearly points the way. It is because of the general absence of well-defined methods of procedure in the work of dairy inspection that

the federal government has interested itself in establishing such a system of inspection in all parts of the country. This system, too, requires the inspector as well as the dairyman to *see* and to study the details of dairy equipment and dairy methods and to discuss and record existing conditions in clear, definite terms which can neither be misunderstood or misinterpreted.

Those dairymen who do not seek of their own accord to improve their business can only be helped through such a system of inspection as will be educational in its nature. Failing to profit by that, and to rise to the established standards of their market, they will naturally be eliminated from the milk business.

To the fourth and last question, "Is it worth while, or is there any regard for those whose product finally reaches the higher standard of cleanliness?" we must find an answer.

The standards of cleanliness governing the production and distribution of milk are being raised by health officials until the production and distribution of milk is entrusted to those and those *only* who have proper equipment and facilities for carrying on the work. The man who has a proper knowledge of the work and who is willing to supply a clean, safe product should not be held down in competition by those who have neither proper knowledge or equipment and who make the production of milk a neglected side issue, rather than a properly conducted business.

If it is better to build a fence about the top of a precipice than to maintain a hospital and graveyard at its bottom, then the more progressive dairymen and health officials by working and conferring together must come to an understanding and seek to establish and live up to such standards and requirements as will remove from the milk supply the least possible danger or suspicion.

The better class of producers, distributors, health officials, and the better class of newspapers should combine their forces and influence and use the means at their command to teach consumers the truth regarding the value of clean

milk and some other things they do not generally know, and of which they cannot in ignorance judge for themselves. The public should be made acquainted with the fact that a quart of clean milk is easily worth in actual food value twelve cents or more. The public must be made to realize that they have long been buying for about fifty cents a full dollar's worth of food material. If to the bare cost of maintaining a farm and feeding cows and caring for the products in a very ordinary way there shall be added the cost of *cleanliness*, of healthy cows, proper equipment, and clean methods throughout, *who* can justly complain? Will not such a procedure be for the direct benefit and health of all concerned? Will there not be less discomfort, worry, and loss of time and money because of illness? Will not the consumption of milk increase when it can be freely used with perfect safety? I believe all this is possible and that it is a condition that in a few years is to be generally realized even as it is now realized in some places in a comparatively small way. Fortunately, the price of cleanliness plus the bare cost of production need not be so great as to impose any hardship on the consumer. He may not then, as now, when he buys milk, be able to get a dollar's worth of food material for fifty cents, but he will still be able to buy milk, and *clean milk*, too, at bargain prices. It has been clearly demonstrated that it is "worth while" and that there is a financial reward for those dairymen whose premises and product finally reach a higher standard of cleanliness. *We must, eventually, have clean, wholesome milk.*

## DAIRY CONDITIONS IN NEW HAMPSHIRE.

BY PROF. FRED RASMUSSEN.

During the last year the New Hampshire experiment station has conducted a survey of the state in order to obtain information in regard to the existing conditions, especially in regard to methods of handling dairy stock and dairy products.



Information was first obtained through correspondence. Letters were sent to two hundred and eighty-six granges in the state for information as to the possible increase and decrease in dairying, prices obtained from dairy products, and names of dairy farmers. A circular letter was later sent to the dairy farmers whose names had been obtained from the granges, asking for information in regard to the dairy business, especially with reference to breed of cattle, number of cattle kept, disposal of product and prices obtained for same.

After having gained such general information as could be obtained through correspondence a representative was sent to visit different sections in the state to obtain more detailed information to learn as far as possible through personal contact the prevailing ideas on different subjects, and also to verify the information already obtained through correspondence. In all, one hundred and ten farms have been visited.

#### INCREASE AND DECREASE IN DAIRYING IN NEW HAMPSHIRE.

Forty-four towns reported an increase in dairying, thirty-seven reported a decrease, while twenty-seven reported the dairy business as normal. No doubt there has been a decrease in the dairy business in the state during the last year, especially due to the very material advance in price for concentrated feedstuff and rather high price which could be obtained for hay. The droughts of 1907 and 1908 also made it necessary for many farmers to reduce their number of cattle. Although the figures given above will indicate an increase in dairying, it is doubtful whether the increase is greater than the decrease. There seems to be an unsettled condition, a changing from one system of farming to another.

At the present time, however, it is quite common to hear the remark from farmers that sooner or later it would be necessary to go into the dairy business or at least keep some livestock on the farm, as they cannot continue to raise profitable crops without the use of farm manure. Whatever may be said about keeping up and increasing soil fertility by the

use of commercial fertilizers and a rotation of crops, the fact remains that the livestock industry has *always* been the backbone of agriculture.

The kind of farming to be carried on in different parts of this country will more and more depend upon the demand, prices, and nearness to market for the product for which the soil and climate are both adapted.

The state of New Hampshire, for instance, cannot expect to compete with Iowa in the manufacture of butter, nor Illinois in the production of pork and beef, nor Wisconsin in the manufacture of cheese. The conditions in New Hampshire, however, are favorable for the production of market milk, as well as a limited amount of butter and cheese to be sold locally. The territory from which milk can be drawn to a city is limited on account of the perishability of the product and the increased cost of shipping in proportion to the distance from the market. Milk is a staple article of food for which the demand and the price have been gradually increased. Besides furnishing milk to our rapidly-growing cities within the state, milk in large quantities is daily shipped to such cities as Haverhill, Lowell, and Boston on the south, and Portland, Maine, on the north. The local demand for fresh butter and cheese is greater than the supply.

The soil and climate are favorable for the production of grasses and forage crops suitable for the dairy cow. The demand and prices for dairy products are increasing. The conditions for dairying are not only favorable, but in many sections dairying seems necessary to make profitable other branches of agriculture. Considering these facts, an increase instead of a decrease in dairying in New Hampshire is to be expected.

The field work of the experiment station shows that many farmers are making but a very small profit in the dairy business. In many cases this was due to a lack of understanding of some of the fundamental principles involved in breeding and feeding of dairy cattle, a lack of study of the details of the business and a lack of faith in dairying as an enterprise.

## DAIRY CATTLE ON NEW HAMPSHIRE FARMS.

One of the most striking features in visiting many New Hampshire dairy herds is a lack of uniformity. There seems to be an unusual desire on the part of many farmers to mix breeds. It is quite common to find in the same herd grades and crosses of five or six different breeds besides a number of animals called "common stock" that can claim no particular breeding.

There are three principal causes for this condition:

1. A lack of purpose in breeding.
2. A change in the market for dairy products.
3. The present milk standard.

*1. A Lack of Purpose in Breeding.*

The principal reason for the lack of uniformity in breeding is a failure on the part of the farmer to carefully consider and stick to the breed which is best adapted to his conditions, taking into consideration the general condition of his farm and his market for dairy products. The following is the experience of one farmer visited a short time ago:

Fifteen years ago he started in to raise Jerseys. For several years he had bad luck with his cows, so he decided to change to Ayrshires. A pure-bred bull was purchased. Since several of his neighbors had no bulls and the bulls in the community were grades of inferior quality, this farmer thought that his neighbors would patronize his bull, but when he asked one dollar per cow the farmers would rather take their cows to the grade bulls and save fifty cents. Later this man bought a Holstein bull as he was told the Holsteins were better milk producers. At the present time the man keeps no bull and takes his cows to the nearest and cheapest bull, for, as he stated, "I can't see much difference in the calves from the grades and the pure-bred bulls when born."

The size of a calf when born is not the greatest factor in determining his value. The question is, has the calf in-

herited the qualities which will make it valuable for the purpose for which it is intended when it grows into maturity. If a dairy animal, has it inherited the tendencies to produce milk and butterfat? That many farmers lack purpose in breeding and lack faith in pure-bred animals is often due to the fact that they can see no immediate return in cash. In the improvement of a herd by the use of a pure-bred sire, it takes about five years before an increase in the milk production is obtained, due to the influences of the bull. After this period, however, a rapid increase can be expected.

*2. A Change in Markets for Dairy Products Due to an Increasing Demand for City Milk.*

During the last five years many farmers have changed from selling milk to creameries or from making farm butter into selling milk to contractors. In many instances the cows which had been selected and kept for the production of butter fat did not prove profitable for the production of market milk, and it was necessary to infuse new blood into the herd from milk-producing strains.

*3. The Present Standard for Milk.*

The New Hampshire milk standard requires 13 percent solids and 3.5 percent fat during the winter months. Since this standard is higher than the average percent solids for both the Holstein and Ayrshire breed, the two breeds most commonly kept for the production of market milk, it is often when efforts have been made to breed up pure-bred herds that difficulty has been encountered in keeping the milk up to this high standard. The result has often been that cross breeding has been resorted to, breaking up the uniformity of the herd and checking herd improvement.

The statistics gathered from the field work show the following result in regard to the number of pure-bred sires and grade sires found on one hundred and ten farms visited:

Pure bred, 30 or 27.3 percent.

Grades or crosses, 63 or 57.2 percent.

None, 17 or 15.5 percent.

It was found that men who had reported pure-bred sires, when questioned, would explain that the bull was not registered, but that the man from whom it was bought had stated it could be or he had stated it was just as good as a registered. Whether such statements or guarantees are worthless or valuable depends on the character and the knowledge of the man who made them.

The many grades and cross-bred bulls found in New Hampshire are in a large measure responsible for the low average production of the New Hampshire cow and the small profit obtained in the dairy business of many farmers. Not only grades of the dairy breed were found but in several instances grade bulls of beef breeds, especially Herefords, were found heading herds producing market milk. Wherever such practices are carried on it is needless to say that a retrogression instead of an improvement in the herd and in the production of milk will be found. The greatest, most rapid, and cheapest improvement in New Hampshire dairy herds and dairy conditions must come not through the buying of high-priced dairy cows, but through buying bulls of dairy breeds with dairy qualities. A good pure-bred bull used on grade cows is sure to give improvement, as the strong characters of the pure-bred bull will predominate in the offspring much more than the weaker blood of the grade cows. Thus the bull becomes more than one half the herd.

If pure-bred animals of different breeds are mated the strong characters of the different breeds seldom blend well, and the result often is that while two strong desirable characters are struggling with each other for supremacy some undesirable dormant character will get a chance to predominate.

The fact that a pure-bred animal is registered and is a good individual is not always a guarantee of excellence.



The real value in buying a pure-bred animal lies in the fact that it gives an opportunity to study the ancestors. The influence of an individual seldom exceeds 50 percent, while the other 50 percent in the offspring is accounted for by the preceding five or six generations. In buying a pure-bred dairy bull, therefore, all the information possible in regard to the production of milk of the ancestry of his family should be obtained, and it is especially desirable that the dam and granddam on the sire's side should be good producers.

The man who keeps cows to keep up his herd cannot expect a permanent increase in his production or expect an improvement in his cattle. A great many cows are sold because they have been found to be unprofitable. Furthermore, the man who constantly buys cows is in danger of introducing tuberculosis into his herd, if the cows are not bought on the tuberculin test.

#### BUSINESS METHODS IN DAIRY FARMING.

Before starting on the field work the names of a considerable number of farmers who were keeping records of their cows had been obtained through correspondence. It was soon found out that people's ideas of keeping records varied. Some had weighed the milk for one milking and some for one day shortly after calving, others for a week, when they thought they had an exceptionally good cow. Some were found who weighed the total amount of milk from the herd, but did not keep track of the individual cow. A few farmers kept daily records. Two of these, however, had never added up the result. One had added all the figures and had it on a piece of paper, but when he came to look for it it was lost. In order for records of the production and cost of production to be of value they must be kept systematically. If not kept daily they must be kept at regular intervals. Records are not only valuable for immediate use, but they are especially valuable for study, reference, and comparison, and many times such study would enable a man to increase his profit materially.

## COST OF PRODUCTION OF DAIRY PRODUCTS.

During the last year the experiment station has made a study of twelve dairy herds in order to find out approximately what it cost to produce a can of milk and a pound of butter, of which the following is the result of some of this work.

Herd No. 3; 11 cows. Average for winter months:

Cost of producing milk per can.....	28.5 cts.
Selling price per can.....	32.5 "
Profit .....	4.0 cts.

Average for summer months:

Cost of producing milk per can.....	10.2 cts.
Selling price .....	27.7 "
Profit .....	17.5 cts.

The average cost of production during the winter months is the highest found in the twelve herds of which records are kept. The principal reason for the high cost is due to the following:

1. Breed of cows better adapted for production of butter-fat than milk.
2. Little or no efforts were made in feeding cows according to production.
3. Poorly compounded rations.

Herd No. 6; 24 cows. Average for winter months:

Selling price of milk per can.....	32.6 cts.
Cost of producing milk per can.....	21.6 "
Profit .....	11.5 cts.

Average for summer months:

Selling price of milk per can.....	28.9 cts.
Cost of production per can.....	8.2 "
Profit .....	20.7 cts.

In this herd are a few pure-bred cows, but the larger portion are well-bred grades. The best cow produced seven thousand nine hundred and two pounds in ten months. Daily records have been kept of the individual production for several years. The herd is considered somewhat above the average. Silage has been fed and the grain ration was well balanced. Judging from this and from the records of other herds showing very nearly the same cost of production, twenty-one cents per can seems as cheaply as milk could be produced from a good grade herd in the winter of 1908.

The cost of producing milk in the summer varied from 3.1 to 19.9 cents per can. In Herd No. 6 from two to six pounds of grain and from fifteen to thirty pounds of soiling crops were fed according to the condition of the pasture. The dry season of last summer making it necessary for many farmers not only to feed grain but also in many instances hay, accounts for the great variation in the cost of production during the summer months, and, judging from the records available, but few farmers produced a can of milk for less than ten cents per can.

The best cow of which records have been completed during ten months produced seven thousand nine hundred and two pounds of milk at a cost of 52.36 cents, making a total profit of 72.49 cents.

#### INCREASING PROFITS IN DAIRYING.

The increase in the profit in dairying in New Hampshire must come through better stock, cheaper roughage and grain, and a careful study of the details of the business which cannot be carried on without systematic keeping of records.

The improvement in the dairy stock must come through carefully selected pure-bred sires of dairy breeds. In selecting the breed, carefully consider the condition of the farm and the market for the product. Stick to the breed selected and avoid cross breeding.

In many of the rations studied the cost of the roughage fed is more than the cost of the grain even when eight to

nine pounds of grain were fed daily. Timothy hay is a very poor hay to feed to dairy cows, and at sixteen dollars to eighteen dollars a ton it is altogether too expensive. Corn fodder or still better corn silage is a great deal better and also cheaper, as much more can be raised per acre. There is need of more silos on New Hampshire farms, both for summer and winter use. Oats and peas can be used to good advantage to cheapen the ration, as it makes a very valuable soiling crop when pastures are short and also makes very good hay. Clover hay and millet also makes a very good cow feed. It will surely pay the dairymen to raise more of these crops both for winter and summer use.

It is very difficult, if not impossible, to feed a cow so that the greatest return can be obtained without keeping record of the amount of feed consumed and the milk produced, and there is probably no work in connection with handling a dairy herd of as great importance, and for which the dairyman will be so well repaid, as the time spent in keeping records.

## FORESTRY IN NEW HAMPSHIRE.

BY E. C. HIRST, STATE FORESTER.

During the past few years so much has been said and written in this country upon the subject of forestry that the effect upon the public has been somewhat bewildering. Our magazines and newspapers are printing a great many articles on different phases of the subject, and it has come about so recently that the underlying principles of forestry—the plain, everyday facts—have not had time to crystalize out in the public mind. And so it seems to me that what forestry needs most in this country is a better understanding by the public. It is only within the past year or so that any considerable number of people have had a very clear idea of just what forestry really means. And even now it conveys widely different ideas to different people. Some think it is a kind of an organized effort to prevent the forests from being cut. Others think it refers to the preservation of shade trees

along the highways. Some people have the idea that the object of forestry is to keep forests growing so as not to spoil the landscape. And again others consider it a pleasant form of amusement for a few well-meaning people of wealth, who would rather see the trees growing than to have them cut.

Now, forestry is not any one of these things, but is something very practical, something which has more possibilities for the future of New Hampshire than any other one public question.

Let us then see what forestry really is. Briefly, it is the management of timber land with a view to continued use. In other words, it is an intelligent effort to treat timberland so that the future crops may be provided for as well as the present crop and the land may be continuously productive.

I have prepared a statement in one sentence of what forestry proposes to do. This is in part original and in part a quotation. It covers the ground and is the best short statement on forestry that I can give you: Forestry aims to find out what lands are best suited for timber growing than for other uses, and on these lands it "aims to grow the largest amount of timber of the highest quality in the shortest possible time," and in the end to get the highest price for the product.

How do these things apply to our forests? Let us consider them step by step.

In the first place, forestry aims to find out what lands are better suited for timber growing than for other uses. It would be poor economy indeed to use good farm land for growing timber. You would think any man foolish to set out pine trees on land which could grow a good crop of corn. However, thousands of acres of our hill land cannot be farmed successfully on account of its rocky surface, and every acre of such land should be growing timber.

In the second place, forestry aims to grow the largest amount of timber of the highest quality. To realize just what this means the next time you go into a pine woods



notice how many of the trees have long branches extending in all directions taking up a great deal of room in the forest. In the same woods you will probably observe places where the trees are tall and straight and grow close together with few branches. Now imagine one of these old branchy pines to be removed and its place to be occupied by tall, straight trees. You will at once see that the old, branchy tree is occupying a place in the forest large enough to permit a great many straight trees to grow. Moreover, the lumber produced in the branchy tree is full of knots and inferior to that produced in the straight trees. The owner of the woodlot is raising less and poorer timber than the land is capable of producing. If a little attention had been paid to this stand when it was young and the open spaces planted up, the whole woodlot today would be evenly covered with a growth as good as is found in the best places.

Many of our hardwood stands furnish good examples of how neglect reduces the value of a forest. Go into a forest of maple, beech, and birch, and see how many old, over-mature trees you will find. Select one of these trees and study it. You will find that it is growing very slowly and beginning to decay. This does not mean that the tree has always been slow growing. It means that the time of rapid growth has passed, the tree has passed its prime and is beginning to decline. Some day a windstorm will blow it over, and its value for timber will be gone forever. You would consider it very poor farming for a man to raise a crop of oats and then let it stand in the field and decay. And yet a great many trees in our hardwood forests are decaying without being used. The only difference between the crop of trees and the crop of oats is that the trees require no care, but just grow up. But is this any reason why we should not try to get the highest possible yields from our forest lands. Forestry means the cutting of such trees just as the growth begins to slow down and before the trees decay. We thereby get the advantage of the rapid growth, and then, before the tree begins to decline, it is cut down to make room

for young trees which are coming up. In other words, by cutting at the right time we get more timber and better timber.

In the third place, my definition of forestry said it aimed to grow a crop of trees in the shortest possible time. Now, there are several ways in which the time required to grow a crop of trees may be reduced. One of these is by a judicious thinning of the stand from time to time. When a dense stand of trees is left to itself, the trees use up a great deal of energy in competing with each other. If the stand is thinned out the remaining trees grow much faster and are ready for a final cutting at an earlier date besides furnishing cordwood in the thinnings. Wise forest management may be counted on invariably to produce a crop of trees in a shorter time than nature, unassisted, will ordinarily do.

Then, in the fourth place, forestry aims to get the highest price for the product. You may be surprised to know that forestry has anything to do with the selling of timber. But there is nothing which means more to the cause of forestry than for an owner to secure good prices for the timber which he raises. When you consider the fact that timber is increasing in value all the time, you realize how important it is to know how much timber there is on a woodlot and how fast it is growing.

Take the case of box boards. Ten years ago pine box boards were selling at \$9 to \$10 per M. Lately they have sold as high as \$20 to \$22, an increase of over 100 percent in ten years, or 10 percent a year. Now these stands of pine from twenty to fifty years old are growing at the rate of 3 to 6 percent a year. Add the growth of the timber to the increase in value and you will see that the owner of young pine timber during the past ten years has been making 13 to 16 percent. Where can you find a better investment?

The time was when most of our timber was cut at water mills. The mill was always there and the timber could be taken to it at any time. Now a great deal of cutting is done by portable mills. The woodlots are bought as a whole,

and the result is that judicious cutting cannot be practiced. In communities where stationary steam-mills or water-mills are found, the demand is steady and owners of timber land can generally afford to make conservative cuttings. Where such mills do exist, it seems to me that the timber owners would do well to establish community sawmills where their timber can be sawed at a reasonable cost, thus enabling them to cut when they desire, instead of having to wait for a portable mill to come into town in order to sell their timber.

Now, does our definition of forestry sound like a doctrine of "Woodman, woodman, spare that tree?" Does it sound like the dream of a sentimentalist? Let us reconsider it.

First, forestry aims to find out what lands are better suited to timber growing than to other uses. That simply means that we must not let our enthusiasm for forestry overcome our judgment, and that we should confine forests to land which cannot be farmed profitably.

Second, forestry aims to grow the largest amount of timber of the highest quality. That means that we must cut the trees before they decline in value, that we must cut away the crooked and worthless trees and make room for trees which will be worth more.

Third, forestry aims to raise a crop of trees in the shortest possible time. That means that we must cut carefully so that a new crop will start quickly, and that, wherever possible, thinnings should be made so that the trees will grow faster.

Fourth, forestry aims to get the highest price for the timber. This means that we must study our market and milling conditions and apply good business sense to the practice of forestry.

Now, the question remains: Are we justified in applying these principles to the forests of New Hampshire? For an answer to this let us look a little further.

In the lake states, once the center of the pine industry, the supply has dwindled to a small percent of its former size. The hardwood supply of the lake states and the Ohio basin

has passed its prime, and is declining rapidly, and the land once cleared is converted into farms with no prospect of another forest. The southern yellow pine, from the South Atlantic and Gulf states, so important in our eastern market, is being rapidly cut away, and on most of the land the formation of a new stand of trees is a very slow process.

Now, what does this mean? It means that as the supply of timber on our eastern states diminishes, the hill land of New York, New England, and the Southern Appalachians will be called upon to grow the maximum amount of timber which the soil will produce. The sharp advance in timber prices in New England during the past decade is an indication of the trend of events, and we may look for a greater demand and higher price as the years go by.

Now, is it not about time for us to look ahead to this increased demand and inevitable higher prices and get all the hill land we can into thrifty growing timber? Is it not a wise, far-sighted policy to make our timber lands yield as much as possible against the day when the demand is going to be greater and the price higher?

It is with this ultimate aim in mind that the New Hampshire Forestry Commission is working. By the enactment of the recent law the state made a long forward step in its forestry policy. The main part of the law deals with forest fires and this is the proper place to begin forestry legislation. The law prohibits the setting of fires at any time on the land of another without the consent of the owner.

It provides for the appointment of a thoroughly reliable fire warden in each town, whose duty it is to extinguish forest fires when they occur. The warden has the power to require assistance in putting out fires. He also keeps the woodland posted with fire notices and sees that the law is carried out.

Besides this the law provided that the forester should give advice and assistance to private owners in handling their woodlands. So many applications have been received for this kind of work that several men could be kept busy visiting

the people who really desire to make a start in the practice of forestry.

Under the present law, and with the present appropriation of eight thousand dollars, we are doing everything that can be done; we are making a start. Let us now consider what the future of the state forest policy should be.

To my mind it is New Hampshire's duty to her citizens to develop her forestry work along four lines: First, she should give all the timber land in the commonwealth ample protection against fire. Second, she should give her citizens all the assistance they desire in applying forestry to their own woodland. Third, she should help them to plant up their waste lands; and fourth, she should own and operate state forests.

First, in the matter of fire protection, there is a vast difference between the wild mountain lands and the thickly settled towns. In the mountain lands it is almost impossible to get effective fire protection where one man is appointed for a town, and no other provision made. Maine and New York have worked out the best scheme for protecting their wild lands against fire. In those states several towns are grouped together in one district and a chief fire warden appointed for that district. This officer gives his entire time to the work, and under him are the wardens and deputies in each town. Lookout stations are established on the mountain tops connected by telephone lines so that a fire is detected when it starts and the warden can get his men out to extinguish it. Then, in times of drought, patrolmen are kept at work watching the most frequented trails and camp sites.

A system of this kind could be established in New Hampshire by classing the towns in one river valley in the same district. All the wardens, deputies, lookout men, and patrolmen would be under the district chief. Probably four or five districts would include all our wild land, and about fifteen lookout stations would be sufficient to keep all the forest land from Lake Winnepesaukee to the Canadian line under observation in times of drought.



In a thickly settled town a system of this kind is not called for. A fire warden is needed with deputies in different parts of the town, and the town fire departments should be equipped for handling brush fires. But the work that will have more effect than anything else is to inform all the people about the law and get them thoroughly aroused to the need of forest protection. When you consider that sixty percent of all the forest fires in the state are due to carelessness of people in the woods, you realize how important it is to keep this matter constantly before the public through the free use of fire notices.

In the second place, it is the duty of the state to help private owners in the handling of timber land according to forestry principles. Our present law provides that the state forester shall assist counties, towns, individuals, and corporations in the care of their timber land. There are a great many people in this state who would like to give practical forestry a test on their own land if they could have some suggestions about what to do. The forester visits as many people as his time will permit, but this is a comparative few. Everyone who wishes to know what forestry will do for him should get the information he seeks. We should have a force of men who could visit the woodland of those desiring to practice forestry and make recommendations on the ground about the cutting, brush disposal, future growth, etc., and tell the owner what such work will cost and what profit he may reasonably expect.

Now, in the third place, the state should help private owners to plant up their waste lands. Think how many thousands of acres in this that are not producing anything that could be made productive by forest planting. The best figures we have on white pine growth shows a net yield of two dollars and fifty cents per acre per year. Do your hill pastures show an income so large as that?

Forest planting, under ordinary circumstances, involves all expense of seven dollars to ten dollars per acre. It is of great importance in this connection that the state should

have a forest nursery from which it could distribute seedlings all over the state at just what it costs to raise them. A state nursery would do more for forestry than anything else, in that it would permit private owners to reforest their own land at a very low cost.

In the fourth place, the state should own tracts of forest land in different places on which definite systems of management could be carried out. A small forest in each community owned by the state and operated according to forestry principles would do more to get private owners to practice forestry than all the talk in the world.

Now we often hear it said that the American people are very improvident, that they are destroying their forest resources with no thought to the future and that they should profit by the example of the far-seeing Germans, who are growing their forests as fast as they cut them. There may be considerable truth in the assertion, but in making such a statement do we realize that Germany has gone through the same experiences that are confronting us today? What brought Germany to adopt a conservative forest policy was the threatened destruction of her forests. The diminished supply and the consequent high prices made the practice of forestry possible.

The same causes are at work with us today. Forestry is the salvation of two thirds of our land surface in New Hampshire, and the sharp advance in lumber prices in recent years is rapidly making it profitable for private owners to engage in its practice.

And now in conclusion, let us remember what forestry is, and second, what is the duty of the state.

Whatever assertions we read or hear about forestry, let us remember that it aims to find out what lands are better suited for timber than for farming, and that on these lands it aims to "grow the largest amount of timber of the highest quality in the shortest possible time," and to get the highest price for the product.

And, in considering what New Hampshire should do, let

us get the idea firmly fixed that fire protection should be extended by the fire warden service, by lookouts and patrol; that enough help should be employed to give assistance to every timber owner who desires it; that a state nursery should be operated to permit private owners to plant up their own land at a low cost and that the state should own and operate state forests.

These duties well performed will require more money, but they will in turn increase the wealth of the state by increasing the wealth of every owner of forest land.

### FARMING FOR PROFIT.

BY N. P. HULL, DIAMONDALE, MICH.

What are we farming for, if not for profit? Some seem to be farming for fun, but there has always been more fun, and more satisfaction for me, in farming, when I got a profit, and the more profit the more fun, and the more satisfaction. Most of us are operating our farms that we may be able to accumulate something to the end that we may surround ourselves and our families with the comforts of life, educate our children, and provide against our old age. If we succeed in doing this, we must get a profit from our business. Profit to a farmer in his business means just as much to him as profit means to any other man in any other business. Go into any township in almost any state that you will and you will find prosperous farmers; farmers that make a profit; farmers that work only reasonably hard; their wives and their boys and girls work; at the end of the year they have something to show for their labor. At the end of ten or twenty years the farmer has provided financially against his old age or calamity, if it should come.

Very often, across the road or alongside of him, another farmer is working harder with his hands; his wife is working harder than a woman ever ought to have to work, and his boys and girls are working hard, but at the end of the year they have nothing to show for their hard work. Often

ten or even twenty years, all they have to show for their hard labor is the bare fact of having existed. It is too bad that this should be so. Most often his endeavors have been along lines that did not yield a profit. He has done too much work with his hands and not enough work with his head. Because he did not know the real business end of his business, he spent too much of his time unprofitably.

I believe that the man who makes the great end and aim of his life that of acquiring dollars makes of his life a gigantic mistake, but, on the other hand, I just as firmly believe that when a man sets aside a part of his time to devote to his business, to the end that he may provide for his wants and the wants of his family, he owes it to himself, to his family, and his community to so conduct his business as to get just as much of his time as is possible to get and get honestly. The profit that we get from our business for the year measures the commercial value of our life for that year. And surely our life will be short enough so that we ought to get all out of it that is possible, at least, up to that time that we have provided for our probable needs. How many farmers here who have been farming for the last ten years can tell me which crop they have raised for that time has, on an average, paid them the most profit, or which line of livestock of the lines they have handled has paid them the most profit? If you cannot tell this, has your experience profited you all that it should, or wherein does your experience enable you to better guide your endeavors for the next ten years? I believe that the Lord knew what he was doing when he made a farmer. He gave him strong hands and strong arms, because there was work to do in the world, and the farmer had his share of the world's work to do, and I believe He knew what He was doing when He had a part of his anatomy above his ears, and put brains therein. And I think He expected the farmer to use those brains to more intelligently guide the efforts of his hands, that their labor might count to him for more.

A certain farmer in Michigan sent his son to our agri-

cultural college. He took a course in horticulture. After graduating he went back to his father's farm. The father had ten acres of apple orchard. The son said to him, "Father, let me manage the orchard." The father said, "Because you have been to college, you think you know more about handling orchards than I, and I have been at it for years." The son said, "Dad, it seems to me that you have made a mistake somewhere, either you made a mistake when you furnished the money to enable me to learn what I have, or you are making a mistake in not letting me use it."

This was a hard nut for the old gentleman to crack. He said: "Well, boy, take the orchard and manage it a year. I guess you won't spoil it in one year." The boy took the orchard. He pruned and sprayed it as he had been taught to do, and he made more profit from that ten acres of orchard that year than his father had made in the previous ten years. The boy had no stronger hands nor stronger arms than his father, but the work of his hand was more intelligently directed, and he made one year of his life in growing apples of as much value as ten years of his father's life had been. Let us take one crop to illustrate this matter of profit. On our farm we must grow about fifty-five baskets of corn, together with the resulting corn stover, at the average price of corn at husking time, just to pay for the cost of production. I think I could grow corn until I was a hundred years old and never be any better off for growing corn if I did not make my acres produce more than fifty-five baskets each. If I am to put in part of my life growing corn, I want something to show for it, i. e., I want a profit. I ought to have, at least, a profit of 6 percent. Well, if I can, by getting better seed, better soil, and better methods, produce four baskets more per acre I will make 6 percent profit. If I can produce eight baskets more, or sixty-three baskets per acre, I will make 12 percent, or as much again profit as when I produced fifty-nine baskets per acre. Let us put it this way: granting my figures of fifty-five baskets are right, I am growing fifty-nine baskets, my neighbor is



growing sixty-three baskets. He is getting as much again profit as I. This means I must plow my ground again, plant it again, and cultivate and harvest another crop of fifty-nine baskets, then I, too, have eight baskets of corn profit, but I have put in two years to do it, while my neighbor got his profit in one year. In other words, his time has been worth as much again in growing corn as has mine. He has accomplished as much in one year as I have in two years by growing four baskets of corn more per acre than I.

Ten years ago, while giving a dairy talk at an institute in Michigan, I advised those who were dairying to know their business, to know what it cost to feed each cow, and what each cow returned for her feed.

A young man came to me after the meeting and talked with me about it. I told him there was one thing above all others that a dairyman couldn't afford, that was, *not* to know his business. That young man took my advice. Eight years after I attended an institute at that place again. This young man had a record of what each cow he had owned had done for him for those years. He had had to sell a good many poor cows. He bought a good sire and raised better cows. He had convinced himself that it paid to feed cows well and take good care of them. His average production the first year was 184 pounds of butter per cow. His average after eight years was 376 pounds of butter per cow. He made as much profit each year dairying when he got 376 pounds per cow as he made in five years getting 184 pounds per cow. By knowing his business he had multiplied the value of that part of his time that he put into dairying by five.

To increase our profits and make farming as profitable as it ought to be we must know the business end of our business better by putting more brain product into our work, and by increasing our enthusiasm and incentives to do as well as we already know how to do. I am sure we can, on an average, *double* the commercial value of time that we put into farming.

## THE IMPORTANCE OF THE AVAILABILITY OF FERTILIZER CONSTITUENTS.

BY PROF. E. B. VOORHEES, NEW BRUNSWICK, N. J.

There is no one question connected with farming that is nowadays receiving quite so much attention as that of soil fertility. The students of agricultural problems have long been aware of and have warned the public that the methods of farm practice, if continued, would result in the conditions which have now become acute, and have awakened the entire public to the necessity of constructive rather than destructive methods of conserving, rather than wasting, our natural resources as they exist in the soil.

Unfortunately, the advice given and the recommendations made have fallen in large part on dull ears. Conservation has now become popular, but is not yet understood in its best sense.

It has not been realized by those other industries of our own as well as of all countries, which are dependent upon agriculture, that the warnings given were really intended to be heeded, and it was not until these industries began to suffer or to see that danger was imminent that the matter became of public interest, one which touched very closely the affairs of the whole people.

Recently, however, various industries, dependent upon successful agriculture for their present and continued prosperity, have awakened to a realizing sense that our natural resources as they exist in our soils have been woefully wasted and that unless prompt measures are taken their interests and business will be materially reduced.

The question, while very broad in its application, is really a very narrow one from one standpoint. The whole matter simmers down to a question of available nitrogen, phosphoric acid and potash, for after all the farmer's business is really to convert into salable products the nitrogen, phosphoric acid, and potash as they exist in our soils, and just

in proportion as our soils contain large quantities of these constituents, just in that proportion will it be possible to grow crops; but whether the crops are profitable or not depends not so much upon the total amount of these constituents in our soils, as upon the amount that can be made available for each crop.

The danger, as I apprehend it, is not that there is any real possibility of our even finally exhausting the soil constituents, but rather the danger of reducing to a low point the content of the available constituents. We have enough potential fertility, but are not careful enough to provide for a continuous supply of active fertility; we have not been careful enough in maintaining conditions which promote soil activities.

In most instances, because of the wasteful and careless methods of farm practice, these conditions of soils which make for available fertility have not been observed. We have rather, by our methods, been changing too rapidly those characteristics of soils which promote the change of dormant plant food into active. It is quite possible, too, that if our attention was directed solely to the improvement of soils in this respect, it probably would meet the situation insofar as the growing of staple crops, as wheat, corn and hay, is concerned.

The present conditions, however, because of our complicated methods of living and our advanced civilization, demand not only the crops that are normal, but also those that are in a sense abnormal, and farming has come to be not altogether a question of the conversion of dormant plant food into active, but rather in addition a supplying of special kinds and forms of food to soils. We must be able not only to grow products of a special character, but to make soils naturally unfitted from the standpoint of fertility, but especially fitted from the standpoint of physical character, capable of producing crops of a highly specialized character and of high commercial value.

To do this it is necessary to use not only amendments in the form of lime, green manures, cover crops, etc., but to supply the fertilizer constituents, nitrogen, phosphoric acid, and potash, in the right forms at the right time, and in sufficient amounts. This need has given rise to the demand for commercial fertilizers, differing from the natural products in that it is possible to secure the elements in concentrated and highly available forms, and thus to control both the yield and the quality of the crop.

In the past, as well as at present, much time has been and is being given to a study, not only to the sources of supply and character of the ingredients themselves, but to their manipulation and manufacture or treatment in order to have them meet the requirements in the best manner.

As near as can be estimated we are using in this country today five millions tons of commercial fertilizers, which at an average cost to the farmer of \$29 per ton (and I have used this figure as fairly representative of the cost) makes a total expenditure of \$14,500,000.

The farmers have bought this fertilizer for the sake of increasing their yield and improving the quality of grain and hay and potatoes and fruit, market garden crops and specialized products. The money was really expended for nitrogen, phosphoric acid, and potash, and the returns that the farmers have obtained from their expenditures have been due not altogether to the amounts that have been applied, but to the proportion of these amounts applied that the plants have been able to obtain from the soil and to convert into plant tissue.

Hence, one of the questions which it was necessary to study in connection with source or supply of these constituents, because of its great economic bearing, was their possible rate of availability; the amount of the total applied, that under average climatic and seasonal condition the crops could obtain, or, in other words, to determine as far as possible the amounts that were immediately "available" to the plants.

In the case of phosphoric acid and potash, it was early assumed that these constituents when applied would practically remain in the soil until removed by plants. This assumption, which has been shown by further investigation to be not absolutely correct, is sufficiently accurate to make a sharp line of distinction between the minerals and the nitrogenous substances. That is, it is assumed that if, from the amounts of phosphoric acid and potash applied, but small percentages are removed the first year, the remainder will be a source of supply until it is finally taken out by the plants; soils rather than plants are benefited, and the future, or potential fertility, is increased.

On the other hand, nitrogen, an element which, when existing in the combined form, more especially in organic compounds, must decay before the plants can use it, and because in the processes of decay there is a likelihood of a very considerable loss of ammonia, or of free nitrogen, into the air, or a possible loss of the nitrogen after it has been decomposed, due to the fact that it seldom recombines into an insoluble form, and thus is liable to be lost in drainage.

These considerations make the question of how much available may be expected from certain definite amounts applied, an important one, and also suggests that the value to the farmer of a pound of any one of the constituents for crop growing will be in proportion to its rate of availability. That is, while it is not possible to fix a valuation to a fertilizer constituent that shall measure its agricultural value, there should be a sharp line of distinction between the cost of that known to be immediately available and that known to be slowly available.

This point was clearly recognized in the earlier studies that were made of the subject. For example, in the case of phosphoric acid. Until the discovery of phosphate rocks of various sorts in this and other countries, animal bone was the chief material from which phosphorus was derived for fertilizer purposes, and it was quickly recognized that,



because the finer portions of the bone were more likely to decay quickly than the coarser bone, sharp commercial distinctions should be and were made between fine bone and coarse bone, the finer bone bringing a higher price in the market than the coarser bone.

The same thing exists at the present time: coarsely crushed bone, even though perfectly capable of being handled and applied, does not bring so large a price in the market as the fine, the distinction being based in part at least upon the agricultural value of the two grades.

Probably, too, greater attention has been given by the agricultural chemists and fertilizer manufacturers to the question of the availability of phosphoric acid and the adjustment of prices therefor than for any other one constituent, notwithstanding it, from the standpoint of cost per pound, is much less important than nitrogen.

The fact that mineral phosphates, even though ground exceedingly fine, were not capable of rapidly giving up their phosphoric acid to plants, led to methods of treatment whereby the rate of "availability" might be much greater than was even possible by pulverizing the rock to an impalpable powder. After the process for the manufacture of superphosphates was perfected, the insoluble portions in mineral phosphates were then, and are even now, regarded as of very little value as compared with the soluble. The first patent for making superphosphates was granted to Sir J. B. Lawes, in 1842, from which is cited the following specifications:

"AND WHEREAS it is in particular well known that in the case of a large proportion of the soils of this country, the application of bone dust is of no utility in producing crops of turnips on account of the slow decomposition of the bone dust in the soil and the consequent exposure of the young plant for a long period to the ravages of the turnip fly, *now*, the first of my said improvements consists in decomposing, in manner following, the said bones, bone ash,

bone dust and other phosphoritic substances. Previous to using them for the purposes of manure, I mix with the bones, bone ash, or bone dust, or with apatite or phosphorite, or any other substance containing phosphoric acid, a quantity of sulphuric acid just sufficient to set free as much phosphoric acid as will hold in solution the undecomposed phosphate of lime."

The fertilizer manufacturer or the farmer who buys considerable quantities of a mineral superphosphate, and asks for quotations, will find that they are based upon the "total available," the insoluble being absolutely ignored, even though possessing some value. Furthermore, because what is known as available is not all in the form of soluble, and thus readily distributed throughout the entire soil, the portion which is not soluble and which is not insoluble, but what is called "reverted," is given a lower value than that which is soluble.

The European chemists to this day base their prices for available upon the content of soluble, giving practically no consideration to that which is termed "reverted." For a long time the method used for determining "reverted" clearly separated the soluble, or monocalcic, from the reverted, or dicalcic. In other words, the methods of analysis that were used separated or gave the percentages of the three forms, soluble, or monocalcic, reverted, or dicalcic, and insoluble, or tricalcic.

When, however, further investigation showed that there were also iron and alumina phosphates, which showed a rate of availability between that shown for the dicalcic and the tricalcic—that is, which was more available than the tricalcic, but less available than the reverted—the methods were still further modified, in order to include these forms in the total called "available," or that possible for the plants to acquire in a reasonable time, and values being fixed accordingly, the insoluble, the least available, being quoted at the lowest price, and the soluble, the most available,

quoted at the highest price per unit—the iron and alumina phosphates costing less than the soluble.

Nevertheless, discussions and controversies are still going on to some extent, chemists are still working over the problem and probably will continue for many years, but in this country the method now used in most states for determining reverted phosphoric acid was adopted at a Convention of Official Agricultural Chemists, Cincinnati, Ohio, in 1881.

I present these references in order to show that in the case of phosphoric acid, a constituent not very expensive even in best forms, very great care has been taken to devise methods to determine its availability in the different materials. This work was based upon the knowledge that the value of a pound of phosphoric acid to the farmer is measured in large degree by the rate at which it will be taken up, and quotations that we have at the present time bear out the statement that this point is commercially recognized.

For example, wholesale quotations on tankage and ground fish or fish scrap, products which carry considerable amounts of phosphoric acid, which, because in insoluble form and because varying in quantity, are not suited to make superphosphates, are at the present time \$2.90 to \$2.95 per unit of ammonia and 10, the "10" meaning 10 cents per unit of bone phosphate, or about 1 cent per pound for phosphoric acid.

The same methods are used in quoting superphosphates or acid phosphate. The present quotations are for varying grades 60 to 75 cents per unit of available phosphoric acid the "available" meaning the soluble plus the "reverted," and no quotation is included for the insoluble, which exists to a greater or less extent in all superphosphates. That is, values are based entirely upon the available phosphoric acid.

The charges, therefore, for available phosphoric acid range from 3 to 3.75 cents per pound. For insoluble phosphoric acid, 1 cent per pound for organic in bones, fish, etc., and one half cent for it in the unground rock, and these distinctions

are maintained relatively when the phosphoric acid is found in mixtures. Unfortunately, chemists are not able yet to separate and indicate clearly the amounts in mixtures derived from organic and inorganic compounds, which virtually puts the insoluble phosphoric acid derived from minerals in the same class as organic.

Still, the point is that commercial conditions do recognize the agricultural value in these particulars, and prices are fixed accordingly. Whether it would pay the farmer to use organic and mineral ground phosphates, at the lower price, rather than superphosphate, will depend upon the kind of farming that is being done, and upon the character of the soils upon which the goods are applied, because these factors have a marked influence upon the rate of availability of the insoluble phosphates, but it must be admitted that in no case can these insoluble materials profitably serve as the entire source of supply for quick-growing crops or upon soils deficient in vegetable matter.

In my judgment, they should be regarded rather as amendments, the purpose of which is to build up the soils; to add to the potential fertility rather than to serve the purpose of supplying available plant-food.

#### AVAILABILITY OF POTASH.

In the case of potash, also, sharp distinctions are made between available and unavailable, although unfortunately the question of availability in the supplies of potash is not so difficult a one to adjust as in the case of the phosphates, as the potash used in fertilizers is derived practically altogether from the well-known German potash salts, all of which are soluble in water, readily distribute themselves, and are theoretically equally available, if equally soluble. The organic substances carrying potash, contain relatively small amounts, which do not readily dissolve in water.

Solubility is the basis of measurement of availability of potash compounds, and no values have been attached to the

insoluble forms existing in marls or other potash-bearing materials. There are those nowadays who would reverse the scriptural injunction "not to give your friend a stone when he asks for bread," by urging the purchase of insoluble potash compounds as fertilizers and indicating that bread may be obtained from stones.

That these compounds should be carefully studied, and their proper position determined, is recognized. So far, however, experiments show that the potash in many of the marls, feldspathic rocks, ground lava, and other minerals containing high percentages of potash, is not available in the strict sense, and even when ground are expensive at any price.

That is, without special treatment, which is too expensive, the potash is available in proportion to the rate of decomposition under natural condition, which would be true of all of the original constituents of soils. Hence, thus far there has been no necessity for a strict classification and valuing of these products.

The availability of the potash is, too, of less importance than the influence the different forms may have on the different products grown, muriate having been shown, for example, to be less useful for potatoes, tobacco, small fruits, etc., than are the sulphates and carbonates, and the difference in cost per pound of potash being due, not to differences in availability to cost of production, but to the supposed difference in effects on the quality of crop.

It is quite evident from the studies that have been made, and the results that have been obtained, that the conditions in reference to the availability of the minerals and the distinctions that are now made between those on a commercial basis are fairly satisfactory. Farmers need not pay high prices for their unavailable phosphoric acid and potash in mixed fertilizers. That is, most mixed fertilizers do now contain, so far as phosphoric acid and potash are concerned, relatively small amounts of the insoluble forms and the



cost of the insoluble is very much less than for the available. Clear distinctions are drawn, and the farmer owes it to himself to make such selections as will reduce the cost to him of plant-food not intended for immediate use, but as amendments.

### NITROGEN.

In the case of nitrogen, the most expensive element, and the one most likely to be lost in the transformations that may take place in the soil, the conditions are not so favorable, in fact, are decidedly unfavorable.

Early investigators soon discovered that combined organic forms of nitrogen were incapable of feeding plants to any extent; that practically the plant derived its nitrogen entirely from soluble forms, and chiefly in the form of nitrate, the final result of decomposition.

The measure of availability of nitrogenous materials is, therefore, the form and, in the case of organic materials, rate of decay; those products which show a reasonably rapid decay being regarded as agriculturally more valuable than those which decay slowly, and that it did not always follow that nitrogenous materials carrying high percentages of nitrogen would be likely to decay no more quickly than those containing lower percentages, provided the physical character was such as to prevent the soil-decay agencies from exercising their activities.

In order, therefore, that the farmer might have definite knowledge as to the relative availability of different materials, various methods were suggested for separating the good from the poor. It was found easy enough to devise methods which would clearly separate nitrate from ammonia, and nitrate and ammonia from organic nitrogen, but no method has yet been devised that will separate the nitrogen from the different kinds of organic matter contained in mixtures.

Oxidization methods were probably the first to be used to any considerable extent, the assumption being that the more

readily the substance was oxidized the more quickly would the nitrogen become available in the soil. The permanganate method, now under examination as to its usefulness, is capable of separating, in a broad way, the good from the poor, but does not work uniformly with both animal and vegetable matter, though used to some extent, and is, therefore, not an absolutely safe guide.

The digestive method has also been used, based on the assumption that pepsin or other digestive substances would more quickly digest the organic matter from substances likely to decay quickly than from those likely to decay slowly. This method has also proved useful up to a certain point, but is not sufficiently accurate to determine clearly the relative availability of the material. It is only a guide as to whether the nitrogenous substance is likely to be poor or good, and thus making it possible to classify the nitrogen into the two groups.

Neither of these methods clearly indicate whether the percentages oxidized or digested would have a higher or lower rate of availability when compared with nitrate, the soluble form of nitrogen.

The present annual consumption of fertilizers is, as near as can be estimated, 5,000,000 tons, which at an average cost of \$29 per ton, makes a total expenditure of \$145,000,000.

This great quantity of fertilizer is being used for increasing the crops of grain, hay, potatoes, fruits and market garden crops. The money was expended for nitrogen, phosphoric acid and potash, and notwithstanding the claims made for superior brands and special formulas, the returns have been due to the actual amounts of nitrogen, phosphoric acid and potash that these crops have been able to obtain from the total in the fertilizers used.

The value of the increased crops made from the use of any one or more of these constituents is, however, measured both by the amount that the crop obtained, and the char-

acter of the crop obtaining it. A pound of nitrogen, phosphoric acid or potash, when used in making a crop of celery, or of asparagus, or of fruit, would be worth more than if used in making a crop of wheat, rye or hay. Furthermore, the value to the user of the nitrogen or other constituent bought in a fertilizer is measured both by the amount that the immediate crop is liable to obtain, and the proportionate amount of the total that would eventually be gathered.

Of the sum annually paid for the three constituents, nitrogen, phosphoric acid, and potash, on the basis of an average of ammonia 3%, available phosphoric acid 8%, potash 5%, about 48%, or \$69,600,000, is paid for nitrogen, which is the only one of the three essential elements that is liable to suffer any considerable loss; while but 32% for phosphoric acid, or \$46,400,000, and 20%, or \$29,000,000, for the potash, but little more than half of the total expenditure is made for the two elements, not liable to be lost, and for which available plant-food is obtained; the 48% is paid for a constituent liable to be lost, and when in organic form liable to be unavailable.

The experiments conducted along this line show, on the average, not more than 70% of the quantities of nitrogen applied, even in the best forms, is recovered in the crops.

From the standpoint of crop, it is evident that the utilization of nitrogen is a much more important matter than the use of phosphoric acid and potash, although the further fact that a pound of nitrogen, capable of being used in a commercial fertilizer, and without regard to form, costs from four to five times as much as a pound of "available" phosphoric acid or of potash, is an additional argument in favor of greater care in its purchase and use.

Nitrogen as nitrate is the only commercial form soluble in water, ready for immediate use by most plants; nitrogen, as ammonia, is also a form soluble in water, but it is less available than the nitrate. A pound of nitrate and a pound of ammonia, being definite chemical compounds, are quite as good from one source as another.

Organic forms of nitrogen have to decay first, changing to ammonia and then to nitrate, and are therefore less quickly available; besides, they vary in their rate of availability according to the source of supply and their physical character. Materials which are likely to decay quickly, as dried blood, dried meat, dried fish and cottonseed meal, do show a high rate of availability, while forms like ground leather and ground peat show a very low rate of availability. A pound of organic nitrogen varies in availability, therefore, according to its source, whether derived from dried blood or peat, or from intermediate products.

Since nitrogenous materials are variable in their rate of availability—that is, the rate at which the nitrogen in them may be absorbed by the plant—the farmer desires to know the dependence that can be placed on the different materials; he wants available nitrogen. Hence, the chemical and physical characteristics of the various forms of nitrogen have been made the subject of every considerable study and investigation, in order that at least approximate values in respect to availability may be attached to each form. Sufficient work has been done thus far to establish a pretty safe relationship between the nitrate, ammonia and organic nitrogen, in the form of dried blood. It has not been possible, yet, to investigate fully all of the various forms of organic nitrogen, so as to assign an exact value for the different materials.

The very extensive investigations conducted by Dr. Paul Wagner, at Darmstadt, Germany, show that for the crops tested by himself and others, namely, barley, oats, rye, wheat, mangels, sugar beets and potatoes, there was returned in the harvest 62 parts of nitrate nitrogen for every hundred parts applied; 44 parts of ammonia nitrogen for every 100 parts applied, and 40 parts of organic nitrogen for every hundred parts applied as dried blood. In no case is the recovery equal to two thirds of the nitrogen applied; besides, there are wide variations in the amount recovered in the different forms.

In 1898, plant nutrition experiments were begun at the New Jersey Station, one object of which was to study the "relative availability" of these three forms of nitrogen, using a rotation of corn, oats, wheat, and timothy—crops which, because of their long periods of growth would be likely to absorb relatively large proportions of organic nitrogen. The results of these experiments for two rotations (10 years), show that the recovery for nitrogen as nitrate was 62.09 parts per hundred; for the nitrogen as ammonia 43.26 parts per hundred, and for organic (dried blood nitrogen) 40 parts per hundred. These results agree almost exactly with those obtained by Dr. Wagner and his associates. With the returns from nitrate, the highest recovery regarded as 100, the relative availability of the nitrogen as ammonia would be 69.7 and of nitrogen as dried blood 64.4.

These figures possess a very great practical significance, as they have a direct bearing upon the economical purchase and use of the nitrogen contained in the fertilizers now offered upon the market.

Commercial conditions fix the price of the various nitrogenous materials, and the cost to the farmer of any one form is not measured by its usefulness to him, but by the cost in the market. That is, there is no strict relationship between commercial and agricultural values.

It happens that at the present time a pound of nitrogen in the form of nitrate or of ammonia costs the farmer less than a pound of organic nitrogen; that is, the nitrogen possessing the highest rate of availability as nitrate is less expensive to him than dried blood nitrogen, or even that derived from low-grade nitrogenous materials, which do not possess any definite rate and which must, on the average, show a much lower rate of availability than dried blood, because the mixture contains nitrogen from many sources, not uniform in their content of nitrogen or in their physical character of constitution.

Garbage-tankage and tanned leather scraps, for example, are used in large quantities; some of the larger eastern fer-



tilizer factories using several thousand tons per year. The nitrogen in these products is admittedly much less available than is that in dried blood, and its cost to the manufacturers is according to present quotations but little more than one half as high. For garbage tankage, for leather scraps, feathers, wool waste and peat, the prices are merely nominal. The cost of handling and reducing these products to forms capable of being used in mixtures naturally adds, of course, considerable, but they could still be sold somewhere near their value on the basis of availability, and still leave a profit to the manufacturer. These materials should, however, be regarded in the same light as insoluble phosphates and potash compounds, amendments rather than sources of direct supplies of available plant food, and be paid for accordingly.

The Experiment Stations have, since their establishment, consistently urged the farmers, in their purchase of fertilizers, to be guided not only by the quantities of the constituents present in the mixtures offered, but also by the kind that is used in them, pointing out the importance of selecting brands which contain high percentages of available plant food, more especially of nitrogen, because of its relatively greater importance and its higher cost. The results obtained in the investigations referred to emphasize very strongly the wisdom of such advice in reference to the expensive and elusive element nitrogen.

A concrete example will make clearer the economic phases of the question. The analysis of the various brands sold in the state of New Jersey in 1909 shows an average of 2.7% of total nitrogen, divided as follows:

Nitrate	.48%	or 19%	of the total
Ammonia	.77%	" 30%	" " "
Organic	1.32%	" 51%	" " "

Assuming that the forms of organic nitrogen used in these brands were as good as in dried blood, it would require 1.55 lbs. of the organic nitrogen to furnish as much "avail-

able" nitrogen as is contained in one pound of the nitrate nitrogen, and 1.43 lbs. of the ammonia nitrogen to furnish as much "available" nitrogen as is contained in one pound of the nitrate nitrogen. Yet, because of commercial conditions, the farmer paid a higher price per pound for his organic nitrogen than he paid for his ammonia nitrogen. Using the same relations that exist in the commercial cost of nitrogen, the actual prices paid were, for organic nitrogen 26.52 cents per pound, ammonia nitrogen 23.73 cents, and nitrate nitrogen 23 cents. At these prices, the nitrogen purchased in New Jersey last year cost about \$1,157,400, and in the entire country nearly sixty times as much.

If, however, the returns from the different forms of nitrogen were in the same proportion, as indicated in the experiments, which must be admitted to be relatively correct for nitrate and ammonia, and assuming that the organic was as good as that in dried blood, the cost of the "available" nitrogen in the three forms actually was, for organic 41 cents per pound, for ammonia 45 cents per pound, for nitrate 23 cents per pound. While the farmer should have paid, on the basis of availability, for organic 14.8 cents per pound, for ammonia 16.1 cents per pound, for nitrate 23.0 cents per pound, and a saving to the state of \$383,940 would have been effected. If, therefore, instead of buying organic and ammonia nitrogen, nitrate only had been purchased, the same gain in crop from the use of the nitrogen could have been purchased for \$733,460 instead of \$1,157,400.

Assuming that practically the same relations in forms of nitrogen existed for all the fertilizers made and sold in the whole country this year, the actual cost of the nitrogen was, in round numbers, \$60,000,000, while on the basis of available it should have cost but \$43,000,000.

It may be argued that the availability of the organic nitrogen is greater in the warmer climate of the south, where the bulk of the fertilizer is used. This may be true, but is notably counterbalanced by the fact that a much larger proportion of the nitrogen used there is in organic forms. It

is a fact, too, that the present high cost of cottonseed meal has encouraged a larger use of the tankage and other lower grade nitrogenous products.

The point of importance, therefore, is the price that is paid for the organic forms. In the above discussion, it has been assumed that the organic nitrogen contained in the fertilizers has been derived from dried blood, or from other materials quite as good. As a matter of fact, however, dried blood does not constitute even a large proportion of the organic nitrogenous materials used, the bulk of the nitrogen being derived from products of a lower grade. Various kinds of meat and bone, tankage, dried fish, fish scrap, cottonseed meal, garbage tankage, leather meal and even peat, being used to supplement products of the higher grade. These, while genuine nitrogen carriers, have been shown to have a wide range in availability, the leather and peat rating in availability as low as 4 in comparison with nitrate as 100.

It may be urged, first, that these products possess a value as sources of nitrogen; and second, they are valuable as absorbents and in improving the texture of mixtures containing nitrates, acid phosphate and potash salts, as mixtures of chemicals only cannot be applied by machinery; and third, that proper conservation of natural resources demands that waste nitrogenous materials should be utilized. The points are conceded. The experiment stations do not discourage, but strongly encourage, the utilization of waste products containing nitrogen; they would be false to their duty to the farmers, however, if they did not clearly point out to them what is known of the relative agricultural value of such products. It is not solely a question of use—it is a question of cost. The cost to the farmer of a pound of nitrogen in these materials, or a value lower and more variable than the nitrate and ammonia, should be lower rather than higher than for nitrate or ammonia.

It is not economy to save refuse nitrogenous materials, if the cost of the nitrogen to the farmer is greater and his re-

turns less than may be obtained by the use of nitrogen from materials of known value. Farmers have been and are now spending thousands of dollars for nitrogen for which they do not receive a proportionate return.

To the farmer, it is purely a business proposition. He buys nitrogen, in order that he may get a return in crop. If in one case 100 pounds of nitrogen contributes 60 pounds to the crops upon which it is applied, and in another 100 pounds contributes but 40 pounds to the crops, the purchaser should not pay the same for the second as for the first, for if he did so he would pay 50% more per pound for his "available" nitrogen. That is, if the cost of the first hundred pounds was \$14, the second hundred should cost but \$10, when the basis of value is the amount available in each.

## IMPORTANCE OF FOOD INSPECTION WORK.

BY PROF. B. H. SMITH, WASHINGTON, D. C.

The adulteration of foods has long been practiced. Pliny tells us that the bakers of his time added to bread a white earth, soft to the touch and sweet to the taste, which was obtained from a hill near Naples. In the twelfth and thirteenth centuries crime in general was a well-established practice, and we are told by one of the older writers that adulteration of food products at that time was an innocent pastime when compared with the frequency and magnitude of midday highway robbery. A little later, however, we find that the penalties imposed were unusually severe. Thus in 1444 we read that in Germany a dealer in herbs by the name of Jobst Femdecker was burned at the stake with his false saffron. A year later in the same country two men and a woman were buried alive for a similar offense. At Biebrich on the Rhine in 1482 a falsifier of wine was condemned to drink six quarts of his own product, from the effects of which it is reported he died.

One of the first instances of food inspection was that of the ale tester in England. In the early part of the sixteenth century many towns had official ale testers whose duty it was "to try, test, and assay the beer . . . whether the same be wholesome for a man body." It appears that one of the methods of testing was as follows: "The ale was spilt on a wooden seat and on the wet place the tester sat attired in leather breeches, then common enough. If sugar had been added to the beer the tester became so adherent that rising was difficult; but if sugar had not been added it was then said that the dried extract had no adhesive property." We are glad to be able to report, in view of the fact that chemists do not now wear leather breeches, that this test has gone out of vogue, and is not now included among the official methods of the government. Food legislation requiring that weights stated should be correct is far from being



new. By Moses it was said: "Thou shalt have a perfect and just weight; a perfect and just weight shalt thou have," and though this precept has been before the world for a good many centuries, even here in Puritanical New England we are often told that it is absurd to suppose that a quart bottle holds a quart, that a pound package necessarily contains a pound, or that formulae as given on the labels are strictly correct.

A broad and comprehensive food law was enacted in England in 1860, but it was not until fifteen or twenty years later that much attention was paid to the matter in this country. Strange as it may seem, the States had fertilizer laws to prevent adulteration in this commodity some time before general food laws were passed. Massachusetts in 1883 and Ohio in 1886 enacted comprehensive food and drug laws and other states soon followed. In 1903 in the appropriation act of the Department of Agriculture it was provided that this department should inspect the imported food products offered for entry at the various ports. Five laboratories were established under this provision at the time of the passage of the general national act.

#### ORIGIN OF THE FOOD AND DRUGS ACT.

##### SIXTEEN YEARS' AGITATION.

For sixteen years prior to 1906 various pure food bills were constantly before congress. One of the earliest of these passed the senate but failed in the house. Others passed the house but failed in the senate. The bill which finally passed both and became a law was endorsed by two national pure food congresses, by eight annual conventions of the National Retail Grocers Association, by the Consumers' League, and labor organizations and various agricultural associations.

## MANUFACTURERS DOING INTERSTATE BUSINESS.

Manufacturers doing an interstate business had experienced the difficulties and annoyances of conflicting laws. One state required that manufacturers should declare the presence of a preservative. In an adjoining state the amount present must be shown, while in another no preservatives would be allowed at all. One state would require that all weights be declared on packages, while the next would not allow aniline colors, and there was practically no uniformity in the matter of particular legends which various food commissioners required on labels. A national law it was believed would do much to correct this unfortunate condition. The view was taken by many manufacturers, as well as by most food officials, that such a law would tend to harmonize the irregularities of the existing state requirements, and since the law has been on the statute books it has exercised a great influence in this direction.

## STATES HAVE FOLLOWED NATIONAL LAW.

Since the passage of the national act, thirty states, of which New Hampshire is one, have passed laws which follow or conform very closely in general text with the national law or have so amended or modified the laws already on their statute books that the same purpose is accomplished. Other food officials have by rulings brought many of the details of their requirements into unison with the federal act. The passage of the law has therefore accomplished and is accomplishing much toward uniformity in the food laws of the country; in fact, it has doubtless accomplished more in this direction than even its promoters believed would be the case in this length of time.

## ACTION IN THE NORTHWESTERN STATES.

In the central northwest, especially, progress has been made along the lines of uniformity. In most of these states very stringent laws were in effect, but none were exactly alike, and the requirements were as diametrically opposed to

each other as may well be imagined. Since the passage of the federal act the food officials of these states have met and discussed the varying points of their respective laws, with the result that nearly all of them require wherever possible such labels and standards as are in vogue in their sister states, and this does not necessarily mean that the stricter states have relinquished anything, but that the lax states have been brought up to a higher level of enforcement, the result of which is that it is easier for all of the food officials to enforce their laws, and the manufacturers are better off because different labels are not necessary for each different state.

#### STATE OFFICIALS WITHOUT DIRECT CONTROL OVER MANUFACTURER OUTSIDE OF STATE.

One of the principal arguments advanced in favor of the proposed law was that a state official had no direct control over the manufacturer outside of the limits of his own state. Small grocers can be found in every rural community that know practically nothing of food laws. They buy from traveling salesmen representing the manufacturers and the large wholesale houses. The latter from the extent and nature of their business are well informed, and if they make and sell adulterated and misbranded goods they do so with a full knowledge of their liability, and because of this knowledge or negligence, if such should be the case, they should be dealt with vigorously. A little retailer, on the other hand, seldom has any criminal intent. In the majority of cases he took the salesman's word that the goods were all right, paid a good price, and sold them accordingly as high-grade goods, which he supposed them to be. Under the federal law, state or national officers may proceed against the real culprit, the manufacturer.

#### DISTRICT OF COLUMBIA AND TERRITORIES UNPROTECTED.

Another potent reason for food legislation by congress was that the District of Columbia and the territories and insular possessions were practically without protection of

any kind against food adulteration, being governed directly by congress, which had not previously made any provision to safeguard the interests of the consumer in these localities.

#### PUBLIC OPINION.

The law was finally enacted because public opinion demanded that foods be labeled without deception and that drugs be true to name and of standard quality. Widely read journals had laid bare the patent medicine frauds, and "The Jungle," purporting to describe conditions in the packing houses at Chicago, had been extensively read; it should be emphasized also that one of the strongest powers back of the measure was the honest manufacturer and dealer in foods and drugs, who wished protection against the unfair competition of the unscrupulous minority who placed on the market unfair or sophisticated products in competition with standard goods.

#### THE LAW.

The law under which we work is called "The Food and Drugs Act of June 30, 1906," the date of its passage. A brief description of its general provisions may be of interest. In the first place, insofar as the states are concerned, any foods and drugs are not amenable to the law until they are shipped into interstate commerce. The territories and the District of Columbia are directly under the control of congress. It is unlawful, under the act, in the territories or the District of Columbia, to manufacture, ship or sell any article of food or drugs which is adulterated or misbranded within the meaning of the act. Outside of the territories and the District of Columbia, congress has jurisdiction and has to do with only interstate and foreign commerce. It has no jurisdiction over commerce wholly within a state. It is prohibited to sell or deliver for shipment to any point outside the state or receive goods from outside the state and deliver such goods after they have been received if they are adulterated or misbranded.

## ARTICLES TO WHICH THE ACT APPLIES.

The determination of the articles to which the act applies seems to have been the cause of some uncertainty and perhaps consternation among manufacturers and dealers. In general it may be stated that the terms "food" and "drug" are used in their broadest sense and are so interpreted. The law applies to all drugs or medicines for internal or external use for the treatment or prevention of any diseases whatever of man or animals. This, of course, includes liniments, salves, ointment, hair tonics, medicinal soaps, plasters, dentifrices, etc., and also all proprietary and veterinary medicines and stock foods. Under "food" are included all articles used for food, drink, condiment or confectionery.

The subject matter of the law, then, may be divided into foods and drugs, and the object of the law is to prevent adulteration and misbranding. The requirements of the law for drugs are exceedingly simple; in brief, they amount to this: If any alcohol, for any purpose whatever, is present in any medicinal preparation, it must be declared upon the label. Also, any quantity or proportion of habit-forming drugs such as morphine, opium, heroin, cocaine, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate or acetanilide or any derivative or preparation of any such substance, must be shown upon the label, and whether, if the drug is sold under a name recognized in the United States Pharmacopoeia or National Formulary, it differs from the standards of strength, quality or purity as determined by the tests laid down in these authorities. In many localities of the United States substitution in drugs had come to be an alarming evil. Repeated trials, covering long lists of prescriptions, showed that it was the exception, rather than the rule, that one's prescription was correctly filled. It has been shown that this was due to the fact that the goods purchased by the druggist were often adulterated or deficient in strength, as well as to the retailer's desire for gain by substitution of a just-as-good-but-cheaper article. The law merely insists that drugs conform to the requirements of the



Pharmacopoeia, that guide and handbook of physicians and pharmacologists which they themselves have established and upon which standards of strength prescriptions for the sick are based.

A food is deemed adulterated under the act—

First, if any substance has been mixed with it to injuriously affect its quality; as, for instance, a pepper adulterated with ground olive stones or pepper shells.

Second, if any substance is substituted for the article wholly or in part; as when cottonseed oil is sold as olive oil.

Third, when any valuable constituent of an article has been wholly or partly extracted; for illustration, spices partly extracted.

Fourth, if it be mixed, colored, powdered, coated or stained in a manner whereby damage or inferiority is concealed. An example would be that of an inferior rice coated with paraffin and colored with Prussian blue.

Fifth, if it contain any added poisonous ingredient.

Sixth, if it consists, in whole or in part, of a filthy, decomposed or putrid animal or vegetable substance. Illustration: an egg which has passed to that bourne from which no egg returns, unless, perchance, it meets with the formaldehyde treatment of a dried egg factory.

#### MISBRANDING.

Perhaps the most far-reaching provision of the national law is in connection with misbranding. Section eight of the law provides "That the term 'misbranded,' as used herein, shall apply to all drugs, or articles of food, or articles which enter into the composition of food, the package or label of which shall bear any statement, design or device regarding such article, or the ingredients or substances contained therein which shall be false or misleading in any particular, and to any food or drug product which is falsely branded as to the state, territory or country in which it is manufactured or produced."

Under this provision, goods must not be labeled in a manner calculated to deceive the consumer. In other words, common honesty must be strictly adhered to. As an illustration: geographical names are well protected under this section and must not be used in a way to mislead. Such names which do not indicate the origin of the product but merely indicate a species or variety may be used without restriction as to where the article was grown; as, for instance: Delaware grapes. The term "Delaware," when applied to peaches, however, signifies that the fruit was grown in that state and cannot be applied to Maryland or New Jersey peaches. The same may be said of Maine corn, Cape Cod cranberries, Pennsylvania buckwheat, Minnesota flour, Penn Yan lamb or Camembert cheese, all of which are products which are famous for their distinctive properties or superior quality, which may be due to some special character of soil or climate of the region, or the developed skill of the people of that section in producing that substance.

Up to about two years ago ninety percent of the coffee sold in this country was labeled "Mocha and Java," while less than twenty percent of the coffee imported was Mocha and Java. "Superfine Virgin Ne-Plus-Ultra Bordeaux Olive Oil" is no longer pressed from cotton seed in South Carolina. Glucose, perhaps flavored with hickory bark, is still occasionally found under the name of "Vermont Absolutely Pure Maple Syrup," with an elaborate maple sugar orchard as a background. But this interesting species of adulteration is rapidly becoming extinct. Canned brook trout, embellished with a label representing a fisherman landing a speckled beauty from a mountain stream, are none other than our old acquaintances, the Atlantic ocean herring. The man who conceived such a travesty upon the reputation of a self-respecting, an appetizing, and altogether a most delicious but hard-to-catch fish should be condemned to solitary confinement and fed upon his own "brook trout." And codfish, —another maligned New England institution,—haddock, hake, pollock, cusk, etc., are substituted indiscriminately in place of the sacred cod.

Much of the Holland gin sold in Boston has nothing in common with the original except that it is prepared in a low region. Cognac used to come from California; more than that, it also came from New York City and other Frenchless and grapeless localities. More butter has been sold as Elgin than could be produced in that immediate section in a century. "Triple concentrated" on an extract has meant two thirds diluted, and "absolutely harmless" upon the patent medicine is *prima facie* evidence that the product will bear a thorough investigation.

The whole argument regarding misbranding reduces itself to this: when a man wants a particular article, asks for it, and is willing to pay the price, he should get exactly what he asks for and what he pays for. There is absolutely nothing to be said upon the other side of the question except that for a man without scruples there are scruples in it. Occasionally, to a bad case of misbranding, will be pleaded the David Harum defense of *caveat emptor*, and always coupled with the suggestion that the article is not injurious to health. The manufacturer of counterfeit coins is a close cousin of this gentleman, and the same argument would be equally tenable when applied to the defense of his business.

#### GUARANTY.

Another feature of the law which gives rise to interesting questions is the guaranty provision of section nine, which reads, in part, as follows: "That no dealer shall be prosecuted under the provisions of this act when he can establish a guaranty signed by the wholesaler, jobber, manufacturer, or other party residing in the United States, from whom he purchased such articles, to the effect that the same is not adulterated or misbranded within the meaning of this act, designating it." The guaranty is the guaranty of the manufacturer and not of the government. It is executed by the manufacturer or dealer, and when filed with the Department of Agriculture at Washington it protects subsequent possessor of the goods from prosecution. A general misappre-

hension exists as to the meaning of the phrase "guaranteed under the food and drugs act of June 30, 1906." Because of this, labels printed in the future will read, "Guaranteed by the manufacturer under the food and drugs act of June 30, 1906."

#### IMPORTED FOODS.

The systematic inspection work of the Department of Agriculture upon foods and drugs was begun after the passage of the Act of Congress, March 3, 1903, and subsequent similar appropriation acts, which authorized that all foods, drugs, and condiments of foreign production or manufacture be inspected before being allowed entry into this country. The Food and Drugs Act of June 30, 1906, in effect supersedes the earlier acts, and as this important feature of our work is so well established a discussion of the procedure followed in the enforcement of the law relating to imported foods will be spoken of briefly. Both the Department of Agriculture and the Treasury Department are concerned in the execution of the law as it applies to imported foods. Shipments of such merchandise are always in the custody of the Treasury Department, and samples are taken and delivered for inspection and analysis by the Secretary of the Treasury upon the request of the Secretary of Agriculture. Further, the Secretary of the Treasury, upon the request of the Secretary of Agriculture, refuses admission of products found adulterated within the meaning of the law. Thus both departments are interested throughout the whole of the inspection work.

Invoices of goods shipped to this country are made out in triplicate, one copy being forwarded to the consignee, upon which he enters the goods at the custom house, while another copy is forwarded to the Bureau of Chemistry or a branch laboratory, if one is located at the port of destination of the goods. The invoice, as is probably understood, is the bill of goods showing in detail the merchandise imported, giving prices and all items of expense, and is certified by the United States consul at the city from which the goods are

exported. Accompanying an invoice of food products is a sworn statement of the shipper declaring the presence or absence of any preservative, coloring matter, or other added ingredient used in the preparation of the food. The constant examination of these declarations is a valuable aid to the inspector in keeping informed as to the character of goods entering his port. The port laboratory is located upon the same floor of the Appraiser's Stores as that upon which food products are examined by the customs officials for the determination of their value and the duty which is to be levied. The inspecting officer of the Department of Agriculture visits the various examiners having charge of the appraisement of food products, where all invoices are open for his inspection. No invoice containing an item of food product is permitted to be passed by an examiner until it has been inspected by a representative of the Department of Agriculture. If, on inspecting an invoice, the inspector finds no article he desires to sample or further inspect, he stamps the invoice "No Sample Desired. Department of Agriculture." An invoice thus stamped may be returned or passed along to another examiner without further detention. If, however, a sample is desired, there is attached to the invoice a small tag designating the particular case or range of cases from which the sample is wanted. It is then the duty of the examiner to procure this sample and forward it at once to the laboratory of the Bureau of Chemistry, and the appraiser notifies the consignee of the goods that the sample has been taken for inspection purposes and that he should hold intact the remainder of the shipment until the examination is completed and he receives a release or other notice from the Department of Agriculture. Often, when inspecting an invoice, the inspector is unable to decide, until he can see the goods, whether or not a sample should be requested. Take, for instance, the matter of labels. Repeated analyses of certain lines of merchandise inform the inspector as to their composition, and it then becomes a question of the inspection of labels with but an occasional analysis, except for the new brands that may appear from time to time.



The inspector, therefore, in addition to the analytical work of his laboratory, makes a large number of what are called "floor inspections." The contents of practically all of the Appraiser's Stores cases are thus looked over superficially, and where goods are found labeled according to results of previous analyses, they are passed by merely stamping the invoice in the usual manner. Should a case be found not properly labeled, or from which samples are desired for any other purpose, the detention is made and sample requested in the regular way. This form of inspection greatly facilitates the work and it lessens the number of samples sent to the laboratory for analysis. It would be impossible, because of the number of analysts that would be required, to analyze samples from all lines of goods simultaneously, and, accordingly, the policy is adopted of taking up only a few lines of products at a time. These can be well handled and the inspection made complete in every respect. At any time, and without notice, the inspection of any line of products may be discontinued and another taken up, though a line of products that has once been thoroughly covered is never after entirely dropped, as the floor inspection and an occasional analysis of suspected samples serve to keep them under proper control.

After the sample has been requested from a shipment of merchandise it is delivered by the customs examiner to the bureau laboratory. The necessary examination is made, and, if found pure, the consignee is notified that the examination has been completed and that the shipment represented by the same will not be further detained by the Department of Agriculture. If the sample is found adulterated within the meaning of the law, the collector of customs is requested to secure possession of the goods and the importer is notified of the result of the examination and a time set at which he may be present and introduce testimony regarding the case in hand. After the hearing, the findings of the port laboratory, together with a sample of the merchandise, may be sent to the Bureau of Chemistry at Washington for veri-

fication. The chiefs of the branch laboratories have authority to take immediate action regarding such shipments as in their opinion comply with the law. They are also authorized, with the approval of the collector, to take final action in the case of a violation of the law for which a precedent has been established. In cases of doubt regarding violations of the law, and in cases where no precedent has been established through a decision made by the Board of Food and Drug Inspection, which is composed of Doctor Wiley, Doctor Dunlap, and Mr. McCabe, the solicitor of the Department of Agriculture, the matter is referred by the branch laboratory to the bureau for advice. A recommendation is then made by the Board of Food and Drug Inspection to the chief of the branch laboratory, who then requests the proper customs officer to release the shipment, relabel it, or require its transportation beyond the jurisdiction of the United States, as the circumstances may require.

Among the products to which particular attention has been paid in the port inspection work is olive oil. A few years ago it was a common practice to adulterate olive oil with cottonseed oil, but this has now practically been abandoned so far as shipments to this country are concerned. It is significant, however, that France annually imports enormous quantities of cottonseed oil, and, it is said, exports much more so-called olive oil than she produces and imports. It is probable that the less progressive nations who are without food laws receive the larger part of this specially prepared oil, which presumably bears "Lucca" labels. While referring to Lucca it may be stated that but about one fifth as much Lucca oil is now for sale in our markets as two or three months ago. Lucca is a town near Leghorn, in the Province of Tuscany. The finest olives grow in Tuscany, and oil of the best flavor is produced there. The first shipper of olive oil to the United States was a resident of Lucca, and because of the market which this particular Lucca oil had developed, the shippers of oil from Naples and Genoa were soon labeling their oil Lucca, and the practice soon

spread from Algeria to Bordeaux and from Constantinople to Lisbon. The bureau has conducted a vigorous campaign in the matter of labeling olive oils, and a continued careful investigation of invoices, together with the aid of consular agents and food declarations as to origin, has made this particular instance of misbranding largely a thing of the past.

Small quantities of peanut oil have of late been made much use of in the sophistication of edible oils. This is especially true in regard to the oil in which the French and Norwegian sardines are packed. These have been labeled as packed in olive oil, but until recently the "olive oil" of the label was the only indication that the olive branch had been utilized in any way in the production of the product. Peanut oil, when properly refined and clarified, is an excellent edible oil, and though but comparatively little used in this country it is largely used in France. A recent consular report from Bordeaux shows that as much peanut oil as olive oil is being consumed for edible purposes in that city.

Enormous quantities of Italian macaroni are being imported each year; until recently the larger part of it was of a deep yellow artificial color, the object being to imitate the variety prepared with eggs. The colors used appear to have been chosen with little care, Martius yellow and other objectionable dyes being often found. When the importers were notified that poisonous colors must be eliminated and others declared upon the label, it was represented that the demand for imported macaroni would be seriously lessened and that a well-established trade custom required that macaroni be of a deep yellow color. Nevertheless, when the ruling was enforced, a large part of the shipments came without artificial color, and the importers have since been selling as much, if not more, macaroni than ever before.

A reformation has been effected in the labeling of imported cheese. Extensive analyses indicated that a considerable portion of these cheeses was made of skimmed or partially skimmed milk. The following varieties of cheese now bear a label reading "Made from partly skimmed milk":

nearly all Edams from Holland, Parmesan, Caciocavallo, Romano, Regiano from Italy, and Whey from Norway.

During the last fall figs have been carefully scrutinized. The larger part of the imported figs come from Smyrna. The figs are allowed to ripen until they fall on the ground, when they are gathered and transported by caravan to Smyrna. Here they are packed under none too sanitary conditions, and the worms or worm excrement in some of the shipments is rather startling. After examining a few score of cases of questionable figs one feels something like the small school boy whose teacher had been telling her class that recently worms had become so numerous that they destroyed the crops and it was necessary to import the English sparrows to exterminate them. The sparrows multiplied rapidly and in turn were becoming a nuisance. Johnny being apparently inattentive, the teacher, thinking to catch him napping, said: "Johnny, which is worse, to have worms or sparrows?" Johnny replied: "Please, ma'am, I never had the sparrows."

A large part of the imported jams and jellies formerly contained glucose and artificial color. Wine vinegar was made from distilled vinegar by the aid of dyes, and preservatives were used freely in many products, but these grosser adulterations are now not so extensively practiced. Since our requirement of a veterinarian's certificate with each shipment of meat, which must show the kind and condition of the animal from which the article is prepared, the importation of sausage has been almost discontinued. The Chinese are especially sorry to lose their canned dog, and those of you who are in the habit of dining in Harrison avenue may already have missed the old-time flavor of some of your favorite oriental dishes.

A campaign has also been conducted against short weight and short volume. It was formerly the practice to call wine and ale bottles quarts, though they contained but seventy-five percent of a quart, and on canned goods and groceries where a weight was stated the consumer would be fortunate,

indeed, if he obtained as a gross weight the amount indicated. Now, when weight is given, it must be the net weight, and when the volume is given the package must contain the volume indicated.

### DRUGS.

Large quantities of drugs are imported in the crude state, and at the time of the passage of the national act it was found that a large part of these were badly adulterated. Belladonna root at that time contained from twenty to forty percent of poke root; benzoin was often wholly artificial, and many shipments of senna leaves contained seeds, stems, and sand. Substitutes having no curative properties were offered, as sarsaparilla root, and the same was true of arnica flowers. Henbane was largely adulterated with an Egyptian plant of large size which cost but one twentieth as much as the true henbane and is of no value whatever where henbane is used medicinally. Cut dandelion root consisted of trimmings from chickory, and shipments of nux vomica were imported which were made up of small, worthless seeds rolled in clay until of the proper size.

Powdered drugs were often worse than the crude article. Gentian was offered for import containing fifty percent of ground olive pits. Belladonna root and ipicac contained much of the same adulterant, and licorice contained worthless bark peelings, while shipments of ground sage were found to contain twenty-five percent of cornstarch.

These were the products that the retailer was paying a good price for, and it was from these materials that standard pharmaceutical preparations were being made which were used in filling your doctors' prescriptions when you were sick. Those of you who do not profess the Christian Science faith little know how often it may have saved you. All of these products are now carefully scrutinized at each port of entry and the grosser adulterations are becoming less frequent.



## DOMESTIC WORK.

Branch laboratories are now established at the following cities: Boston, Buffalo, Chicago, Cincinnati, Denver, Detroit, Galveston, Honolulu, Kansas City, New Orleans, New York, Omaha, Philadelphia, Pittsburg, Portland (Oregon), St. Louis, St. Paul, San Francisco, Savannah, and Seattle. The articles of interstate commerce which have been examined particularly are gluten flour, honey, spices, flavoring extracts, buckwheat, rye, and other flours, maple and other syrups, breakfast foods, cocaine preparations, and alleged "cures," and attention has also been directed to specific cases in which the use of illegal labels is charged.

Gluten flour is much recommended by physicians to patients suffering with diabetes because of its low starch content. It is prepared from ordinary flour by washing out a large proportion of the starch, and because it is nearly always used by the sick it is essential that flour labeled gluten should be true to name. Such, however, we have not found to be universally the case. In fact, a large proportion of the gluten flour upon the market, until recently, was nothing more nor less than wheat flour. Many others contained but from fifteen to twenty percent of protein instead of thirty-five percent, which should be present in a properly prepared gluten.

In the early days of food adulteration pepper was one of the chief victims. Blythe enumerates the following as among the most common adulterants: linseed meal, rice and wheat flour, woody fiber, chillies, potatoes, spices, chickory, rye, powdered leaves, olive stones, bone dust, salt, and various minerals. It would seem that in those days there would be little danger of the children using an excessive amount of pepper. This spice, at the present time, is not excessively adulterated except for the judicious addition of pepper shells, which is considerably practiced. Buckwheat and rye flours were found to be grossly misbranded. This season's goods, however, in the straight flours, are labeled quite truthfully. The so-called "prepared buckwheat" flours will have to change

their labels once or twice more before they are reasonably correct. When this desired end is obtained most of them will read "Wheat Compound," or, in some instances, "Wheat Middlings Compound," instead of "Buckwheat Compound," as at present.

The bureau has also examined a good many extracts. Methyl, or wood alcohol, which was commonly employed as a solvent but a few years ago, especially in the West, is practically not used at all at present. Extracts are now being sold without the addition of artificial color. In this respect New England is behind the Central West, for, while many manufacturers here still cling to bright colors in their peppermint, wintergreen, pistachio, and some other extracts, the larger Chicago houses have practically discontinued using colors altogether.

#### MAPLE SYRUP.

We have also examined many samples of maple syrup. Probably no product sold has been subject to more adulteration than maple syrup. It has been stated by those who have made a study of maple sugar and syrup statistics that not more than twenty-five percent of the article sold as genuine during the past ten years could have been such. But not only is the straight maple product stretched with various substitutes, but the compounds which declare upon their labels twenty-five percent or fifty percent of cane syrup are not, as a general proposition, true to name. Where fifty percent of maple syrup has been declared it appears to have been customary to use about twenty-five percent, and where twenty-five percent was stated some generous manufacturers have put in enough to impart a flavor, while others have used none at all. The ordinary maple syrup manufacturer uses a very black, inferior grade of sugar which can be procured in Canada, and, at the last of the season, in Vermont, for a very low figure, and this strong flavored article bears much dilution with refined sugar, and yet will pass the usual maple sugar standards.

The flavor of these goods is not to be compared with that of the real article, for which there is an increasing demand. Incidentally, the price which the producer receives has advanced twenty-five percent within the past two years, and is still advancing, while the prices of the imitations have receded and are still receding. Many concerns putting out maple syrup have used Vermont or New Hampshire addresses upon their labels, regardless of where their plant is located or where their maple product comes from. These are now being changed to their true addresses.

An interesting feature of the labels of these compound syrups is the detail with which they are embellished. The basis of the picture is a sugar orchard and camp. Buckets of curious design hang from all the trees in sight, which appear to be oaks, spruces, and hemlocks. The sugar makers, armed with the customary neck yokes, and clad like Esquimaux, with their ears buried in furs, are apparently working at a temperature as low as that reported by Dr. Cook in the Arctic regions. Meanwhile the sap gushes in streams from the spouts in the trees, much on the order of the hydrant just broken off by an automobile. The snow covers the ground and roof of the camp to an apparent depth of several feet, but the gathering tub with a faucet at the top is on wheels and is drawn by a pair of cows. To this fundamental picture is sometimes added, for good measure, a few leaves on the trees, or, perhaps, a leopard or a monkey upon the overhanging branch.

We do not wish to be understood that we are bringing prosecutions on this form of labeling, and it is referred to here simply to illustrate the most remarkable versatility and imagination which the descendants of the wooden nutmeg man possess. They are like the Westfield whip manufacturers who labeled their twenty-five cent whips "Bone Thrown-out," which the persistent inquirer will be informed means that the bone has been "threw out" in their manufacture.

The term "fresh eggs" has been much abused by the cold storage people, and, while there is no objection to selling

eggs as such that have been stored, at least for reasonable lengths of time, it is misleading and fraudulent to sell as "strictly fresh," eggs which have been stored indefinitely and are of most uncertain age. Investigations upon this subject are being carried out, and already prosecutions have been inaugurated.

Another question upon which research work is now being conducted by the bureau is the effect of bleaching upon flour. Within four or five years a large amount of the flour manufactured has been bleached by an electrical process, which consists of drawing a current of air through an electric arc, forming oxides of nitrogen from the oxygen and nitrogen of the air. The flour is then subjected to the chemically changed air and is bleached by the oxids of nitrogen. The latter compounds with moisture form nitrous acid, a powerful antiseptic. Whether the addition of these chemicals to the flour renders such flour injurious to health is a grave question, but at best, in the opinion of the speaker, a serious and far-reaching fraud is perpetrated upon the consumer, as it is possible by the aid of the bleaching process to sell an inferior and low-grade article as a flour of much higher grade. The department has prohibited the shipment in interstate commerce of bleached flour, and is bringing prosecutions at present upon such shipments. A large part of the millers have already abandoned the process.

The oyster industry is an important one. Enormous quantities are shipped from Baltimore and Philadelphia; New York and Boston also send oysters to the interior. An oyster, when taken from salt water and placed in fresh water, "drinks," as it is called, absorbing a large amount of water. The trade practice of "floating" oysters for the purpose of inflating them with superfluous water had become so thoroughly established that a large part of the consumers of oysters had never eaten anything but the floated or soaked variety and were quite unfamiliar with the delicate flavor of a fresh and undiluted oyster. An additional disadvantage of this trade practice was that the consumer, besides paying

for a quart of oysters and obtaining but a little more than a pint, received these in a stale condition, as the floating process required twenty-four hours or more, in addition to that in which they should have been delivered.

As in the case of imported drugs, much work is being done on domestic goods of the same class. The patent medicine impostor has had his first experience of hard times during the past three years. Recently, however, a scheme has been advanced for furthering his ends without incurring liability under the national law. An advertisement claims that by the use of radium, a new electrical method, or by some startling chemical discovery, there has been found a great cure for every ill that man is heir to, from insanity or cancer to fallen arches. The remedy usually consists of flavored Epsom salts, or an equally simple preparation, and is forwarded to the purchaser either without any label at all or under a label to which no exception can be taken. By separate mail, directions, testimonials, and the usual exaggerated and misleading statements are sent in a bulky package. This package is neither food nor drug, and its shipment cannot therefore be stopped under a food and drugs act.

For the collection of samples and the investigation of many questions relating to the adulteration and misbranding of foods, inspectors are required. Sixty men have already been appointed, and it is expected that many more will soon be added to the service. Fair salaries are paid in order to secure high-grade men, a majority of whom are experts in some special field of food production, and therefore are especially equipped for advantageous work upon particular phases of the bureau's investigations. Other men, with a less specialized training, are used for collecting samples and other routine employment.

Samples are purchased in triplicate upon the open market and sent to one of the branch laboratories, or, possibly, to the central laboratory at Washington. One sample is analyzed and the others are held for check purposes if the goods are found adulterated. When a sample is found which does



not comply with the law in the opinion of the chief of the laboratory where it has been analyzed, a report of the facts is made to Washington, with a recommendation. If those in charge of the Division of Foods there find that cases have not already been instituted on the same brand of goods, and if they concur with the branch laboratory that there has been a violation of the law, the case is referred to the office of the chief inspector who determines the legal status of the sample; that is, as to whether or not the shipment went into interstate commerce since January 1, 1907; whether or not there is a guaranty, and, if so, who is protected by it, etc. The party who it is proposed to make the defendant is then given an opportunity to be heard before some official of the department, usually the man in charge of the branch laboratory where the goods were examined. If, in the light of the evidence deduced, it is believed that an action should be instituted and that a case can be maintained, it is referred to the Board of Food and Drug Inspection, and, with their approval, is transmitted from the Secretary of Agriculture to the Attorney-General. The United States District Attorney of the district in which the defendant resides then brings an action against him in the United States courts. But, besides this action *in personam*, an action *in rem* (against the thing) may be instituted when it is first found that the goods are adulterated: i. e., the goods may be seized. Provision for this action is made in section ten of the law, a part of which reads as follows: "That any article of food, drug or liquor that is adulterated or misbranded within the meaning of this act, and is being transported from one state, territory, district, or insular possession to another for sale, or, having been transported, remains unloaded, unsold, or in original unbroken packages, or if it be sold or offered for sale in the District of Columbia or the territories, or insular possessions of the United States, or if it be imported from a foreign country for sale, or if it is intended for export to a foreign country, shall be liable to be proceeded against in any district court of the United States within the district

where the same is found, and seized for confiscation by a process of libel for condemnation."

This section is one of the strong features of the law. A large number of seizures have already been made, and as each case so instituted is widely discussed in the trade papers and the press generally, and as knowledge of the circumstances becomes disseminated far and wide, the manufacturers of such questionable goods secure undesirable notoriety. A seizure of goods in transit, with the unpleasant attendant publicity, possesses much more of terror for the ordinary shipper than the prospect of the usual court trial a long time ahead, with the inherent possibility that the contingencies may arise to cause the dismissal or the abandonment of the prosecution. It is because of this that the cases already brought have had a far-reaching effect in producing immediately almost a reformation in the character of the goods in those lines sent into interstate commerce.

A number of the cases already instituted with a seizure are what might be termed test cases,—cases where the interested party has a fairly good defense; perhaps his position is supported by a trade usage or a well-established custom, but is, nevertheless, a practice which the department believes violates the law. In other instances the seizure is made use of where goods are radically misbranded, and, in still others, where the goods are deemed injurious to health because of the process of manufacture or the ingredients used.

#### CLEANLINESS IN THE MANUFACTURE OF FOOD PRODUCTS.

The department does not wish, in its enforcement of the law, to oppress or work an unnecessary hardship on any manufacturer, but does believe that the law should be administered with due regard for the rights of the consumer, and that commercialism should not prevent the latter from being given a square deal. Professor Ross, of Wisconsin University, in an address in Boston ten days ago, stated that he was told by a government veterinarian in a packing house that the press for increased output was such that if the inspector should leave his post for a few minutes, an armful

of condemned fat would be taken from the receptacle marked condemned and put in that labeled "United States Inspected and Passed." Professor Ross called this statement to the attention of the superintendent, and was told that that matter was "up to the inspector." This attitude fortunately does not characterize a large part of our manufacturers, but other food products as well as meat need close supervision. If it is necessary to inspect meat from hoof to can is it not equally as important that fish be inspected from fin to fish ball; that berries be looked after from pickers to pie, when manufactured under commercial conditions? Gelatine needs supervision from bone or rabbit skin to the finished product; vinegar, when made by many plants, needs supervision from its embryonic condition in pyroligneous acid to the finished "pure cider vinegar"; ancient and venerable eggs should be carefully guarded during the declining months of their existence.

We need everywhere a more adequate sanitary inspection. It is not enough that the product is sterilized by heat and may not therefore be injurious to health. The consumer wishes to be assured that clean materials are used in the preparation of the product he buys, and that it is prepared under sanitary conditions in a clean establishment. A product of this kind will cost slightly more, but the sanitary product is better at any price. And here let me say a word of appreciation of the manufacturer of food products who opens his doors to the public. If a man has a clean place, and if things are there done in a right way, should not the public be taken into his confidence? Many of the better class of manufacturers are following this policy with most gratifying results.

And here we come to a topic of interest to you farmers of New England. I refer to milk production. We should have cleaner milk. We should produce it under the best conditions possible. Our cows should be healthy and well kept; our places well lighted, and our milkroom and utensils should be scrupulously clean. We cannot be too careful in this

matter. It costs more to produce the best, but it is worth while. The consumer, it is true, must pay slightly more for high-grade milk, and the latter, year by year, is becoming educated to this fact.

#### ADULTERATION OF MERCHANDISE.

While speaking of the subject of adulteration it is interesting to note how extensively the art is practiced throughout the whole field of commodities. Paint, oils, coal, lime, cement, textiles of all kinds, leather goods, furs, furniture,—in fact, ninety percent of all that the consumer buys may be adulterated or misbranded. Several states have paint laws, and it has been shown that a considerable proportion of the paint sold in this country contains pyrites or some other cheap filler. It is getting nearly impossible to buy linseed oil that does not contain fish or mineral oil.

Different varieties of coal are widely different in fuel value. One who has cared for a heater knows that some coal has excessive quantities of shale and slate, and that the clinkers and ashes from much high-priced coal is excessive. Good coal should not give more than six percent of ash. Last year I was delivered a supply for personal use which gave, upon different analyses, from twenty to twenty-four percent of ash. After explaining to the dealer that I did not wish to pay \$7.25 a ton for ashes in wholesale lots, this lot was replaced by another which gave but a little over three percent of ash.

In these days when cement is used so extensively as a building material, the quality of the cement and lime is of the most vital importance to the public.

Frauds in textiles are well known and widespread. A large proportion of the goods offered as "all wool" are cotton and shoddy. Mercerized cotton is sold as silk, and linen often contains cotton and other substitutes. An acquaintance, who is a leather salesman for one of the largest leather houses in the country, tells me that it is necessary to weight their sole leather with barites, glucose, or some similar material, in order to meet competition. When a high-grade

house is obliged to resort to this method of retaining trade, is it any wonder that our souls are sorely tried in wet weather and that our fathers tell us of the good old days when boots wore well? There are tricks in all trades, and the furniture man uses the term "mahogany" as loosely as "Mocha Coffee" has been used in the past.

In conclusion, we are convinced that the better grade of manufacturer of food and drugs does not want to misbrand his goods, or, much less, adulterate them, and many of those who have resorted to subterfuge in the past have done so to meet competition and are glad of an opportunity to sell standard goods under true names.

The National Food and Drugs Act has been recently characterized as "the most important law ever passed by any government." These are strong words, but there is no doubt that if the law is enforced justly and vigorously it is destined to be most far-reaching in its effects.

## NEW HAMPSHIRE, THE BELGIUM OF AMERICA.

BY O. L. FRISBEE, PORTSMOUTH, N. H.

"Here's to the land of the sturdy pine,  
The crest of the nation, where the sun does shine,  
Where the weak grow strong, and things grow great;  
Here's to my home, the industrial state."

Belgium is the smallest European state, and is remarkable for its wealth, commerce, and industrial enterprises, which are due to its important natural resources and the intelligence with which the state has fostered agriculture, manufacture, and trade. The former has attained a high state of perfection; eighty-five percent of the land is devoted to farming. Her commerce consists in bringing food products and raw material from abroad in exchange for manufactured articles. Her chief source of prosperity, however, consists in her manufacturing. This is because of the abundance of coal, which is one of the great natural resources of the country.



New Hampshire is one of the smallest American states, but she is three fourths as large as Belgium, and she has important natural resources that will make her, like Belgium, remarkable for her wealth, commerce, and industrial enterprises. Blessed with abundant water power, modern transportation, intelligent labor, with tide water, raw material received quickly from all parts of the world and within easy access to the markets of the world, New Hampshire has great advantages in manufacturing. She has increased her industrial enterprises over fifty percent in the last ten years. She has over one hundred classified industries, with 5,000 establishments with a capital of over \$110,000,000, with a total production of over \$280 to every woman, child, and man in the state. She boasts of the largest cotton mill in the world, and one of her rivers turns more mill machinery than any river in the world. The list of her manufactured products is a very large one. The census showed that the value of the products of manufacturing interests annually were thirty-three millions greater than the preceding decade, and this census will show still greater gains.

New Hampshire has just begun her industrial career. She offers opportunities not dreamed of in the last century. The water power is the greatest single resource of the state, and by proper conservation the water power may be maintained indefinitely and by storage largely increased. But in case of coal, like Belgium, the source of the power is destroyed with the burning of the coal.

This water power will develop New Hampshire as cheap coal has developed Belgium. The application of electricity to the abundant water power and the transmission of the same to every corner of the state will turn the whole state into one large town, as Phillip II said of Belgium. It will do for the other seven counties what water power has done for Merrimack, Hillsborough, and Strafford counties. The great water power of the rivers of the state, among them the Merrimack, Connecticut, Salmon Falls, Cohecho, Androscoggin, and the tidal power of the Piscataqua, harnessed to

electricity will revolutionize the state of New Hampshire and portions of the adjoining states.

Agriculture is the handmaid of industry, and will walk hand in hand with her industrial development.

The movement back to the farm is the sanest movement the people of the United States have taken for generations. The era of the farm is coming. The tide cityward has turned. New Hampshire, with the rest of the country, will be benefited.

The people left the wornout soil of New Hampshire a few years ago, as they thought; the fault was not with the soil, but with the man behind the plow. He has learned since that soil is a laboratory in which chemical, biological, and physical changes are constantly going on. Its fertility depends upon four principal changes or functions: that the plant must eat, feed, breathe, and have perfect sanitary environments. When he learned this, a farm that could produce forty bushels an acre would produce three hundred bushels and other farm products in proportion. The conquest of the soil was the conquest of the farm, and that the rehabilitation of New Hampshire. New Hampshire offers ready-made farms.

When Daniel Webster once pointed to the great region stretching westward from the Missouri river and declared that he would never favor the spending of a single cent on its development, because it was a land fit only for wolves and rattlesnakes, he did not reckon that like a miracle irrigation would make this desert bloom and become acres of plenty. What irrigation has done for the West chemistry has done for the East. The West has been reclaimed; let us reclaim the East.

Other potentialities that will assist New Hampshire, besides water power and farming, to take the lead in industrial interest and commercial pursuits and become the Belgium of America are the following: the building of the Atlantic coast canal, the Panama canal, the establishing of forest reserve, free port at Portsmouth, tidal power of the Piscataqua,

revival of the merchant marine, good roads, and winter tourists.

Portsmouth is prepared to use what nature, art, and science has given her, and will become what Antwerp is today, one of the great ports of the world.

Nature intended the Piscataqua river to receive the raw material for the industries of New Hampshire and to send out the finished products to all parts of the world, which the Merrimack river and other rivers of the state used in their manufacturing and sent to the markets of the world. The industrial state of New Hampshire will compete with the markets of the world, as Belgium does, when it secures these conditions.

### THE GRANGE: FROM THE VIEWPOINT OF A NON-MEMBER.

BY DR. JOHN D. QUACKENBOS, NEW LONDON, N. H.

I have been requested by your honorable secretary to present to you this morning, as a nonmember of the organization, my estimate of the State Grange and the work that it is doing and has done for the New Hampshire farmer.

I fail to comprehend why I have been selected for so important a service, unless it be that thirty-eight years of intimate association with the agricultural class, which constitutes the bone and marrow and muscle of our New Hampshire society, implies a sufficiently intelligent acquaintance with the rise of this class, under grange inspiration, from comparative poverty and technical ignorance, to warrant a slender equipment for the task.

Since 1864, when I came as a schoolboy to spend my vacation in the town of Danbury, it is true that I have remained in close touch with agricultural life, consorting with the farmers in an unbroken series of summers. I have enjoyed their hospitality from the White Mountains and the Connecticut Lakes to the Massachusetts border. I am familiar with the places where they dwell; the episodes of mutual

friendship and dependence that bind them together; their meat and their drink, their work and their play, their up-risings and their down-sittings, their incomings and out-goings, their grand manhood, their sublime perseverance in an all but hopeless struggle with a barren soil. Thus I have been, unavoidably, the observer of a conspicuous progress from the days when wants were few and methods of doing things were primitive in the extreme, when views were contracted, when knowledge was pathetically restricted to the squire and the doctor, the schoolmaster and the minister, and some of these were not blessed with a superabundance. In those days a stranger from the city was looked upon as a curiosity. The mass of people had never ridden in a railroad car or seen a steamboat or traveled more than a few miles from their homes. They were positively afraid of the outside world. The civil war that was then fiercely waging was commonly styled "the Nigger War," was deprecated on account of the increase in taxes it occasioned, and I knew good citizens of Danbury who manifested their joy at Confederate victories by discharges of cannon. To be sure, they had never seen a negro, and, as we understand it *now*, perhaps they did not set a sufficient value on the integrity of the Union. One day a negro boy appeared on a train of the Northern Railroad selling papers, and the farmers were not slow to avail themselves of the opportunity to inspect this specimen of a race that had thrown the country into ferment. It became the fashion to drive to the depot from the back country and have a look at "a real live nigger." People lived by barter, largely through the country stores; money as money was rarely handled. I knew farmers who never saw coin except as it was paid to them by traders for the skins of fur-bearing animals they had trapped. A rough and somewhat comfortless life obtained in general.

I recall the old kitchens with big hooks in the ceilings to which were attached wooden bars with curious meats and mysterious bunches of herbs suspended from them; and the whitewashed walls with their strings of onions, festoons of

dried apples, and braids of corn—the old kitchens, where the women combed their long black hair and washed their store teeth in cold spring water, and the schoolma'am, who acted as maid of all work, ventilated her views of an evening; and the mouldy bedrooms, with their narrow mantels, antiquated pictures, and tallow dips, screened from the sun by dark green paper shades, which none but an expert could hoist, where you might take your choice between being smothered in a continent of goose feathers or prodded all night by the protuberances of a corn husk mattress. On one occasion it seemed to me that I lay on bare slats. My early morning expostulations stimulated the information that the hay had “gi’n out” the winter before and they had to feed the bedding to the cattle. And then those cold, dark cellars, with their musty smells and barrels of a novel drink that choked me, but which the natives affected when, in their phrase, they were “all tore out,”—and some of them seemed to be “all tore out” a generous quota of the time. Most of the houses were unpainted, but one in the village, the postoffice building, flaunted white clapboards and green blinds; and to the lady proprietor my father made application for board in 1863. “Wall,” said she, “I don’t want no boarders unless I can make somethin’ handsome out of them; I shall hev to charge you two dollars and a half a week. There ain’t no profit in sectionhands at a dollar and a half.”

Shall I ever forget my first breakfast at this hostelry—my first in New Hampshire? Before me was a platter loaded with saleratus biscuit of lemon-yellow suggestiveness; a dish of hard eggs lost in pork fat, with an occasional island of pork amid the ocean of grease; and a hunk of butter which I am sure no granger present could have tasted and ever thereafter have *opposed* the unlimited manufacture and sale of tinted oleomargarine. “Will you hev tea, coffee or chocolate?” inquired the hostess with beaming interest. Visions of fragrant Mocha, cheering Formosa, and Maillard’s delicious extract rose before my eyes, and I modestly suggested chocolate. There came quickly to my place a cup of light, amber-



colored liquid, which provoked a mild protest from my eager lips, innocent of local drinks, "I said I would have chocolate, but you've sent me tea." "Oh! no, I haven't," ejaculated the presiding lady, and her russet daughter at my side explained how she herself had "gathered that choclet" the preceding autumn from a certain locality on the other side of the hill! It is needless to say that I promptly became absorbed in an interesting wrestle with a hen's egg of ill repute—but then the board was only two dollars and a half a week. There were families in those days that fell short of the possibilities of tea, coffee, chocolate, and pork. Doubtless they were ignorant of the leaf that yielded Hyson and of the herb that gallantly masqueraded as *theo bromo cacao*. I know they were too poor to keep a pig or make a barrel of cider, and the only meat they ever tasted was the salted flesh of woodchucks yanked from stone walls with a ruthless cross between a sickle and a corkscrew.

And then there was the church at the Flat: the dashing young minister dressed in black and decorated with a scarlet tie that swept in a dazzle over either shoulder, and flapped in the vibrations of his rawhide oratory—the grave alternate, who tilled the soil week days and told his flock on a Sabbath of his astounding discovery that "man had sprung from the bamboo and the monkey"; the old women munching "peppermints" to keep them awake during the sermon; and the deacons, who snored in their shirt sleeves amid denunciations that fairly smoked with sulphur. And just before the sermon the whole congregation tore itself loose from the sticky pew backs, and, rising in a body, swung round to face the choir—and immediately after the benediction each fellow and his girl made a rush for their wagon, and the "meetin'" resolved into a rollicking horse race,—where with all this good-natured, careless, homespun life the conduct of agricultural operations as viewed from the standpoint of today was largely a farce. In this *day before the grange* there was no scientific knowledge of agricultural chemistry. Old methods that were efficacious when the soil was young still prevailed.

The arable land was cropped to death, and the farmer did not know how to feed the starved earth. Modern implements were conspicuous for their absence. The traditional "two ends" never met, and the people on the farms were rolling up mortgages year by year that were impossible ever to satisfy.

But all this has changed. A manly and serious purpose has taken the place of the old-time childish aimlessness; intelligent thrift, of ignorant waste alike in opportunity and material; a broad acquaintance with agriculture as a science, of fatal ignorance and indifference; enlightened push, of hidebound conservatism; a clear-sighted, fearless outreach into the world, of a blind neighborhood exclusiveness; love rampant, of love dormant, for knowledge; philanthropic breadth, of selfish narrowness; honest shrewdness, of calculating distrust; up-to-date appointments, of unsanitary inconveniences in home and on farm; cultivated capacity for happiness, of impotence and disability. The farmer's life has deepened, and broadened, and intensified.

The tide has turned. Our farmer has been lifted from the mud of illiteracy and helplessness; he is moving with the current of the times, fully sensible of the fresh conditions of the age and seeking preparation to take advantage of the new resources and the new powers that are to put society on a more exalted basis in this twentieth century; realizing to the full his own best self and the limitless possibilities of his career—and what but the grange has wrought the transformation?

I may be regarded as speaking impartially and dispassionately when I ask your attention to four lines of grange influence that have forcibly impressed me as an outside observer. Permit me to consider briefly

- I. The Grange as an Educator.
- II. The Grange as a Spiritualizing Agency.
- III. The Grange as a Promoter of Fraternal Feeling.
- IV. The Grange as a Believer in the Rights of Woman.

Education literally means "drawing out"—calling into action latent efficiency, intellectual and moral and spiritual. The grange so interprets it, and gives essential shape to this conception in the instruction it offers to its members. Intellectual education implies the symmetrical development of the mental faculties,—reason, judgment, imagination,—and the gradual storing of the mind with serviceable as contrasted with merely ornamental knowledge. When the Spartan king Agesilaus was asked what a child should be instructed in, he replied, "Teach him what will be useful to him when he becomes a man." The grange acts upon this principle, keeping sight also of the moral element in education, and strengthening its members against that combination of appetite and opportunity which constitutes temptation. It believes that there is no soul in which God is not, that in every character there lies imbedded virgin gold which may be found for the seeking and wrought into exquisite shapes. A conspicuous purpose of the grange is therefore practical character building—education along lines of manliness, inspiration to high resolve and noble endeavor. It provides as well for literary and aesthetic culture, without which in some degree the farmer's character must remain ill rounded. It gives lessons in the art of graceful living, and emphasizes the beautiful as well as the worthy thing to do. It recognizes the imagination as a refining and moralizing instrumentality, and bids the patrons of husbandry find in beauty the companion of their waking thoughts, the angel of their dreams, realizing that sensitiveness to the aesthetic thrill equivalents susceptibility to the deepest and sweetest experiences of human life. With all this, while educating in intellectual discernment and power, the grange seeks to awaken a spirit of aspiration and achievement. The keynote of its teaching is progress,—eager, enlightened progress,—progress in intelligence, knowledge, and charity, without sacrifice of Christian sentiment or Christian principle. It is the friend that makes the man do what he can. It preaches the gospel of self help. It urges each member to use the efficiency within

him, and shows him how to do it. It concedes the fact that the human soul delights in a realization of its own power, and responds sublimely to whatever factor, in harmony with St. Paul, holds up before its vision that spiritual potency conferred on it by God as the means of accomplishing lofty purpose, as the way of escape from temptation. The doctrine of the utter helplessness of man, which is harped on so persistently by certain creeds and which has for centuries unsouled the Christian, is taught neither by Jesus nor Paul. God does not turn out mere sale work; he does not create souls without good in them, without power in themselves to help themselves—a mistaken philosophy which every blade of grass controverts, every sun, every diatom. The grange in alignment with this principle labors to create a maximum efficiency in the human machine, and to evoke in each of its members that intellectual courage which clearly discerns and that moral courage which grandly sustains. And this is optimism at its climax, the making the man acquainted with his own best self. And so the grange must be ideally all spirit and life—"the spirit" that is ever struggling to express and realize itself in higher forms, that promises to the human race far more than it has as yet accomplished.

The grange recognizes also the spiritual nature of man, and thus the true oneness of the human and divine nature, man in God's image. As the handmaid of religion, it inculcates a higher realization of truth and a nobler conception of duty. It is a training school in which the soul is prepared for ascent, under Christian inspiration, to the summits of its being, where man recognizes himself as the miracle of miracles; knows himself in his threefold nature, animal, rational, and spiritual, and sets a value on himself as possessed of special aptitude for a higher than mere terrestrial life.

Thirdly, the grange fosters mutual understanding and co-operation; concerted action for common protection and advancement; and a goodwill among its members that intuitively prefers arbitration to litigation as a means of settling differences. Thus it stimulates a love of the visible brother



which roots itself in a deeper love of God. My observation leads me to believe that grange influence inhibits the spirit of self-righteousness, of invidious distinction, of inordinate self-gratification which blinds our eyes to the right of others to be happy, of all readiness to listen to malicious insinuations, of all pleasure in receiving and retailing scandals. It operates somewhat in the line of Ruskin's appeal: "Do justice to your brother, whether you love him or not, and you will come to love him." I believe its altruism to be a religion of giving as opposed to getting.

Finally, the grange interprets the status of woman in harmony with the teaching of the Gospel. In common with the Saviour, it regards and treats her as the equal of man. Jesus accounted woman as much an individual as man, as much a unit in the church and home and nation. Woman in the Gospel system is made the equal of man in every question of privilege; endowed by her Maker with power to choose her own course of action, with the right to the same consideration as a social and intellectual unit, to the same educational advantages, to the same opportunities of making a livelihood, to the same compensation for equally good work. I say it reverently, if Jesus Christ had walked among men in this democratic age, He would, I believe, have given more positive expression to a tenet that is deeply imbedded in his divine philosophy, even universal suffrage at the polls of the nations—suffrage that does not exclude superior intellect and taxed property interests from their right to representation in the legislative chamber simply because in the providence of God they happen to be the endowments of woman. The grange here is in accord with Christian teaching; for it importunes us to believe that each one of us, without regard to sex, is a self-conscious unit, capable of self-examination, self-criticism, self-consistency, cast in the image of the Mind Infinite, trammled by no limitation to its development, with no horizon to the evolution of its deathless powers. Assuredly, when we come to think of it, the national force that has for generations been wasted in America is woman;



and we have cause for rejoicing that at the beginning of this twentieth century, it has come to be recognized that no nation can be truly great in which the rights of woman are not upheld, and her refined intellect is not respected as a directing agency and an impelling power. In its appreciation of the capacity and the sphere of woman, the grange reflects the spirit of Christ, and, thank God, the spirit of the times.

In, then, that it educates along lines intellectual, aesthetic, moral, and spiritual, and educates practically; in that it brings its members close together in the bonds of friendship and brotherly love; in that it acknowledges so emphatically the worth and majesty of true womanhood; in that it pronounces the secret of that ideal training which makes a heaven of home to be the combination and coöperation of a manly, intelligent, unselfish, chivalric fatherhood and a gentle, self-denying, patient, dignified motherhood, in and through a heaven-founded and heaven-blessed marriage union; in that it is antimaterialistic in its influence, and fearlessly proclaims its allegiance to a Supreme Being whom we can all implicitly trust and unreservedly love—I, as an outside, disinterested student of its methods, of the men and women whom it transforms, of the men and women who support it and believe in it, can, with high-minded sincerity, point you to the grange as an instrumentality second only to the Christian church and in full harmony with that church, for the expansion of human minds and the ennoblement of human characters.

#### TEN YEARS' OBSERVATION IN THE DAIRY BUSINESS.

BY W. D. HAYDEN, DOVER, N. H.

My purpose in this paper is to present the dairy business of New England, or this section of New England, from a commercial standpoint. First we will take up the dairy and dairyman; second, the consumer; third, we will discuss them both together.

We have very few modern dairy plants in New Hampshire. Nine tenths of the milk is produced in the old-fashioned barn. Over and in front of the cows is stored the hay, with nothing to prevent it from becoming mouldy and damp from the moisture given off by the cattle and contaminated with the odors of the stable. Each time the cattle are fed the stable is filled with dust.

Under the cattle is the manure cellar, sending its foul odors up through cracks in the floor into the stable. If not here the manure is thrown out, behind the cattle, under the eaves of the barn, which I believe is worse than the cellar, as it is generally in the yard where the cattle are turned out to drink.

What windows there are are small and insufficient to properly light the stable. There is no system of ventilation, but in many stables enough fresh air is furnished, through cracks in the barn and ill-fitting doors and windows.

Few of the stalls are constructed in such a manner as to make it easy to keep the cattle clean. Few of the cattle are groomed every day and kept free from having manure clinging to their sides and flanks. An inspector of dairies for one of the Boston contractors told me that their dairies averaged to score fifty-five percent, and from what I know of his scoring it is more liberal than the United States Department scoring.

I will speak of two reasons only, which are responsible for these low-scoring barns. People, as a rule, are copyists, very few are inventive, and farmers are no exception. If a man wishes to build a barn or remodel his old one, he begins to look around to see how others have built or remodeled. Thus with few, if any, model barns to be copied, we make slow progress in improving the dairying of the state.

There is a new stand of buildings in southern New Hampshire which illustrates this point. I am told that they were a copy of a set of buildings in a neighboring town, and as I looked them over I thought what a pity that the owner had

not selected a more modern type as a model. The cattle were kept in a wing, but it was low-posted and hay stored overhead. There was a manure cellar under the cattle all cemented tight, which was an ideal place to keep the manure, but not ideal for the cattle above. The windows were the old-fashioned, two-sash style. One good feature in these buildings was the King system of ventilation. These buildings were arranged so that the work could be done very conveniently, and, if the hay had not been stored above the cattle and the manure under them, and if the stable floor had been of cement, we would have had a modern barn, and it would not have cost any more.

Many dairymen are crowded for room. If, instead of building on a leanto here and there, they would use their present barn for the storage of hay and feed and build a wing, out from some convenient point, thirty-two feet wide and as long as need be, to keep the required number of cows, having two rows facing each other, using cement for the floors, King system of ventilation, and windows swinging in at top, they would have a stable that would score ninety-six instead of fifty-five, and one which would lessen rather than increase the amount of work necessary to care for the cattle.

The Massachusetts Agricultural College at Amherst has, or did have, before they were partially destroyed by fire, the nearest to an ideal set of buildings I have seen. The stable and dairy are constructed entirely of cement and the arrangement seems nearly perfect. Here is a model for the farmers of Massachusetts to follow, if they are going to build new buildings or remodel their old ones. Few practical farmers would have the capital to build a set of buildings that cost what these did, but the general arrangement can be followed with a cheaper building material. I am informed that this plant will score ninety-eight percent according to the Department of Agriculture score card; this is a plant of which the people of Massachusetts may well be proud.

Why have not we at our state institution a model barn for the farmers of New Hampshire to pattern after? We have an expensive set of buildings, but will they score ninety-eight percent? No; nor hardly half of it. We have here pigs in the cellar, the manure dumped at one end of the stable in the open air, on ground that is tiled, drained, and which slopes toward a brook; the cattle yard on one side of the stable and sheep yard on the other, and a milk room, clothes room, and water closet all combined.

We have a fine institution at Durham and one of which we should be proud, and we have a good and efficient president and corps of professors, and we should be proud of them also. We should have a dairy plant that would be a model for any farmer to copy after and one that would score ninety-eight any and every day in the year.

While speaking of the college I want to say a word for a new dairy building. This is a dairy state and we should have a dairy building in connection with our institution. The creamery which is used for that purpose is entirely unfit and inadequate. There ought to be laboratories where experimental work could be carried on in the handling of milk and cream as well as butter and cheese; so that if any man wished to test the efficiency of different methods in handling milk or cream he could send them samples and have them scored as they are scored here at the milk and cream contest.

Now, Fellow Dairymen of New Hampshire, we represent the dairy interests of the state, and we should use all possible influence with the trustees of the college to have them ask the legislature this winter for an appropriation sufficient to remodel the stable and erect a dairy building that will have ample and adequate accommodations for that department. And we must not stop here, each one of us must use our influence with the representative of our own town to have them use their influence and vote to get the appropriation. The other fellows will be at Concord looking after their interests, and we do not want to let them get ahead of us.

The second reason for these low-scoring dairies is that the consuming public does not demand better conditions. That sounds like a bold statement, but I can prove it to my own satisfaction, and I think when the evidence is all in, that you will all agree that there is a good deal of truth in the statement. I will put that second reason in different words and say that the price of milk is too low and is only adequate to pay for the very poorest grade of milk. Now, you will all agree with me at once.

Milk is the only product of the farm that I know of that is so generally sold at one price regardless of quality. The only reason for it being, so far as I can see, is that the difference in quality does not have so marked a contrast to the eye. The quality of fruit is easily determined, but it often takes the chemist to determine the quality of milk. Generally speaking, the Boston contractors who are New Hampshire's principal milk market, pay one price for their milk regardless of quality. So there is no incentive for the farmers to produce anything but the cheapest and poorest article possible so long as they will take it.

But I said that the consuming public does not demand the better product. In Providence, R. I.,—I get my authority from the "New England Homestead,"—City Inspector W. O. Scott, with the aid of the Medical Society, has organized a movement whereby people wishing a sanitary milk can get it by paying an extra cent a quart. The dairies this milk comes from are under inspection and the sanitary conditions guaranteed to consumers. About three thousand quarts of this milk are sold daily. The total consumption of Providence is eighty thousand quarts. Three and seven tenths percent are willing to pay a cent extra for good milk.

In December I wrote to a Boston contractor asking him if he could handle our milk, and this is his reply in part: "It is surprising how little demand there is for high-grade milk among the wealthier people of greater Boston. I do not know as I can offer you an extra price for your milk."

Thus we see that the public is not demanding the better



quality of milk, that is, if they have to pay the extra cost of producing it. I wish to quote from W. O. Scott again. He says: "If people of Providence desire clean, sanitary milk they must be willing to pay for it, because it costs more to produce clean milk than it does to produce dirty milk. No family should begrudge the money spent for clean milk, which means safety to life and health."

As yet the public is not educated to know the value of milk as a food, and by food I mean its actual food value as compared with other foodstuffs. The price of meat goes up one, two or three cents a pound, and eggs go from twenty to forty cents a dozen, and the newspapers make no note of it other than in the market quotations. But you all remember what a time the Boston papers had a year ago, when it was thought necessary to raise the price of milk a cent a quart, and as a result of this cheap newspaper talk the people were led to believe that they were being charged an exorbitant price for this milk and that the farmers wanted to get rich too fast. This led to a decreased consumption of milk, which in reality was one of the cheapest foods the poor could buy. If the farmers only owned the newspapers as well as the Standard Oil does, there would be no trouble getting a cent or two cents a quart more for milk.

Such is the general condition of the dairy business, or, possibly I should say, the milk business of New Hampshire today. There is an exception to this general condition and the exception is growing fast, and in a few years will be the general condition.

Scattered throughout New England there are dairymen who have seen the possibility of increasing their profits by putting out a better grade of milk and there are people scattered through our cities who want a pure, sanitary milk and are willing to pay for it. There we find the producer and consumer brought together for their mutual good: one is getting value for service performed; the other is getting value for price paid.

It is through the education of the consumer that our

boards of health and Department of Agriculture can do more toward obtaining a pure, sanitary milk supply for our cities than in any other way. Let the public know the actual food value of milk and the danger to their health and the health of their children from the use of unsanitary milk. They will demand an inspected article and will have it at whatever the cost. Just as soon as the unsanitary milk ceases to find a consumer it will cease to be produced.

I do not wish to convey the idea that I think the general milk supply is unsanitary, because it is not. That there are many unsanitary dairies and unsanitary dealers' plants that are getting the same price for their product that some of the sanitary plants are getting we will have to admit.

To sum up the whole thing, the needs of the dairy business today is a grading of the milk, the adjustment of price according to cost of production and quality, and the education of the consuming public.

Before closing, I wish to mention a few inexpensive things that the ordinary dairyman can do to improve the quality of the milk: Avoid feeding directly before milking; use plenty of sawdust; clip the flanks and udders of the cows; fasten them up so they cannot lie down before milking, and brush the flanks and udders thoroughly; use small top pails; milk with clean, dry hands; cool the milk quickly and keep it cold. There are only three requirements for good milk: simply, healthy cows, cleanness, and cold. There is no secret about producing good milk; the simplest is the best method.

There was never a time when the prospect of the dairy farmer was so bright as it is today. The successful dairyman of the future will be the one who studies his conditions carefully and arranges his plant so that he can produce the best milk with the least possible work.

## ANNUAL FIELD MEETING, 1909.

---

The twenty-fourth annual field meeting of the New Hampshire State Board of Agriculture was held at Hampton Beach Wednesday, July 28, 1909.

The day was one of the hottest of the summer, a fact which made more grateful the cool sea breezes at this famous and popular resort.

Thousands of people were on the beach during the day enjoying its myriad attractions, both natural and artificial, from wading and bathing in the surf to the comic opera in the theater.

Many of the visitors, however, had in mind the serious business of the day and completely filled the spacious Convention Hall for both the morning and afternoon sessions of the field meeting. In the afternoon, in particular, chairs were brought in to add to the available accommodations, and even then many stood throughout the exercises.

The program of the day held the closet attention of its auditors, and was pronounced, for its diversity, interest, and value, the best in the long series.

Hon. Joseph D. Roberts of Rollinsford, chairman of the board, presided, and most of his fellow members were present, both at the business meeting of the board on Tuesday evening and at the sessions of Wednesday.

The present makeup of the State Board of Agriculture is as follows: His Excellency Henry B. Quinby, governor, Lakeport; Hon. Joseph D. Roberts, chairman, Rollinsford; George H. Wadleigh, vice-chairman, Tilton; Thaddeus W. Barker, Nelson; Edward E. Bishop, Bethlehem; Herbert O. Hadley, Peterborough; Charles B. Hoyt, Sandwich; Daniel C. Westgate, Plainfield; Alden F. Sanborn, Fremont; F. Hale Flanders, East Andover, and N. J. Bachelder, secretary.

At its business meeting the board voted to hold its annual winter meeting at Exeter the second week in January.

### THE FORENOON SESSION.

The Wednesday forenoon session opened promptly at the advertised time of 10.30 with a selection by the Hoyt Orchestra of Portsmouth, which furnished music very acceptably during the day.

President Roberts, in calling to order, spoke briefly but aptly, referring to the heat of the day and saying that on that account he would put his formal address on ice and preserve it for the winter meeting. In behalf of the board, he thanked those present for their manifestation of interest, and said that in the two decades of summer field meetings at Hampton Beach intelligent and attentive audiences always had been the rule.

### STATE FORESTER HIRST.

As the first speaker of the day President Roberts introduced the recently appointed State Forester, E. C. Hirst, who gave a brief but clear and comprehensive statement of the forestry problem of the day, both state and national. This was his second appearance before the people of the state, and he deepened the favorable impression which he made on the occasion of his initial address before the State Board of Trade.

Mr. Hirst addressed himself to his audience as well representative of the people, the farmers of the state, with whom his work would lie very largely and from whom he hoped for valuable assistance and cordial coöperation. The large timber owners, he said, are becoming interested in scientific forestry, but it is the farmers of the state who can do the most, in the aggregate, towards solving the forest problems of New Hampshire.

### THE NATION'S FORESTS.

The United States has in forests, said Mr. Hirst, 1,900,000 acres, of which a million acres are east of the Missouri

river, and the rest west of it; and of this only 200,000,000 acres are in good, growing timber.

At the present time the West is helping to supply the timber needs of the East. Shingles, for instance, from the northwest Pacific coast, are coming into our market. But the West is growing rapidly and soon will be able to use all its own timber, to say nothing of the demands of the Far East market into which it is entering.

That section of our country east of the Mississippi soon must grow all the timber for its own needs. Of its billion acres at the present time something less than one half is not under cultivation and about one third is in timberland.

As to timber acreage the viewpoint of modern forestry is that every acre of land should be devoted to that use for which it is best adapted.

We must produce more timber per acre and we must waste less of that which we do grow.

Germany sets us a splendid example of close utilization and minimum of waste, which we can well follow, especially on those intermediate tracts between cultivated lands and large forest tracts in which the farm woodlot may be classed.

#### NEW HAMPSHIRE FORESTS.

New Hampshire has three kinds of forests, spruce, hardwoods, and white pine.

The spruce is in the mountains, which should be kept in forests, and can be if fire can be kept out. This is important also because of the influence upon the sources of water power.

New Hampshire has water power and she has timber, and it is of vital importance that they should be developed and preserved.

The hardwood forests may be said to represent the intermediate conditions previously referred to as represented by the farm woodlots.

Second growth white pines are abundant all over southern New Hampshire. The stands of it need close supervision



and judicious thinning in order to obtain the best results, and here is where the farm woodlot has the advantage over the larger tract.

The question is asked, Which is the more profitable, to put land into white pine or into farm crops? The answer is, on all the better soil, farm crops, of course.

But there are areas of poor soil and of rocky land where a crop of white pine will give a good return on the investment.

Already most owners of woodlots appreciate their value and are cutting them with a view to regular crops from them. This idea is sure to spread.

Forestry is coming home to the masses of the people as a practical problem. Its object, as Secretary Wilson puts it, is the greatest good to the greatest number in the long run.

Mr. Hirst closed with an appeal to his hearers for co-operation with the forestry officials of the state, and with a few words in regard to the immediately pressing problem of forest fires, which, he said, had engrossed most of his attention since his arrival in New Hampshire.

#### PRACTICAL EDUCATION.

With a few words of commendation and appreciation of the work of the National Department of Agriculture at Washington, President Roberts introduced as the second speaker of the day Professor E. W. Morse, a representative of that department, who spoke upon "The Relation of High School Agriculture to the Farming Community."

The teaching of agriculture in high schools is, he said, one feature of a great educational reform now taking place.

Professor Morse ridiculed the extreme to which book learning had been carried in the past, and declared that the history of education is a history of the stupidity of educators for a thousand years. Most so-called educators, he said, have fought progress at its every stage. Now they are in their last ditch, and we must and will dislodge them from that.

Technical schools like the Massachusetts Institute of Technology at Boston came into being because the old universities like Harvard, Yale, and Princeton were failing to give the boys the training they needed for success in the world. Now this latter class of colleges is falling into line for a practical education, but only because it has been forced upon them.

The speaker quoted from a large number of famous men, varying in type from Admiral Bob Evans to Ralph Waldo Emerson, to show that popular education has been proceeding on wrong lines.

#### THE REASON FOR TRUANCY.

Truancy, said Professor Morse, is a natural revolt against the school conditions of inactivity. "The dreariest studies known to man are taught in the dreariest ways known to men."

He made a lively attack upon conditions in American colleges and laid down a basis for reforms all along the line from the kindergarten to the graduate school.

Children, he said, should not be sent to school at an early age to study books. Evening schools should be provided for adults. Young men should not be sent to college until and unless they are able to stand on their own feet.

To truly educate is to train all the useful faculties of head, hand, and heart.

We must study books when we cannot do any better, but all knowledge obtained from them is of necessity secondhand and not to be compared with that secured from observation and experience.

#### THE OLD RULE A GOOD ONE.

The old-time arrangement of three months for the boys in school and nine months of work on the farm was in many respects an ideal one. There ought to be a law, said the speaker with emphasis, against allowing a child less than eight years of age to study books more than three months in the year.

Professor Morse approved of evening schools and college extension courses, and expressed the belief that it is within the power of everyone to get the equivalent of a college course by home study. He urged parents to post themselves on educational matters and to consider for themselves what is best for their children.

On the whole, he considered the schools of New Hampshire good and New Hampshire a fine place in which to bring up children.

Turning to his assigned subject, the speaker said that the first agricultural high school in this country was established in Minnesota in 1888. Now there are over sixty, besides several hundred schools in which courses in agriculture are given.

Georgia has appropriated \$800,000 for the teaching of agriculture in its public schools. Tennessee requires that agriculture shall be taught in all high schools. The Arkansas legislature has voted \$160,000 for agricultural high schools. The new state of Oklahoma has gone the furthest yet and has required that agriculture be taught in every school.

#### THEY STAY ON THE FARM.

It has been found that in the agricultural high schools, where the use of farm machinery and other practical branches of farm work are taught, the pupils show more interest in their studies than in ordinary schools.

Another of their good results is that their graduates in most cases stay on the farms. This improves social conditions and increases the value of real estate.

Professor Morse acknowledged that agricultural high schools are still an experiment, so far as New England is concerned, and that it might be well, in this section of the country, to begin with agricultural courses in regular high schools and academies, as has been done in a few instances in New Hampshire with success.

Agricultural colleges, he said, are getting better and better, and he urged the parents present to send their sons to

Durham, and then get them back into the home town to spread the gospel of agricultural education.

"All you taxpayers help to pay the expenses of your state college," he pointed out, "and if you do not send your sons there for an education you are not getting your rightful due."

The world demands more of a man today than ever before, said Professor Morse in closing. The boy needs as an aid to success a better technical training than has been given him in the past. And it is up to the people to see that their sons are given such training now and in the future.

#### A MAN FROM TWO STATES.

As the last speaker of the forenoon session Chairman Roberts presented a man, who, he said, was big enough and broad enough to represent two states and hale and hearty enough to deceive anyone as to his age, namely, Hon. J. H. Hale, the famous peach grower of Connecticut and Georgia.

Mr. Hale started his speech from his Georgia home with an account of the New Movement Clubs, which the better class of negroes are organizing through the South with a view to bringing about improved conditions for their race, morally, socially, and industrially.

He described a meeting of one of these clubs which he attended, and gave especially full extracts from the remarks of a colored woman, who had brought herself and her family from almost incredible poverty to comfortable prosperity.

One of her stepping-stones which pleased the audience was her practice, every time her neighbors got a new "yaller pup," of getting a new little pig.

Coming to his subject, "Fruit Growing in New Hampshire," the speaker told his hearers that it cost five hundred dollars to lay down a car of Georgia peaches in this state, and asked why the farmers of New Hampshire were not supplying that market.

The high price of corn of late has put thousands of New England acres into that good crop, and it would be a blessing if the same thing would happen as regards fruit.

Mr. Hale asked for a raising of hands to show how many of those present had fruit from their own gardens for breakfast that morning, and the showing was so small as to bear out his point that the people of New Hampshire little appreciate the fact that they have in their state soil unsurpassed in America for the raising of small fruits.

#### MONEY IN IT.

The essentials of success in fruit growing were stated by Mr. Hale to be hard work, plenty of faith, and reasonable proximity to a good market. Given these and there was sure to be "money in it."

Thousands of acres of land in New Hampshire now in the taxlist at less than \$10 an acre ought to be worth \$1,000 an acre for the production of fruit. The only reason why it is not so valued is because the men of New Hampshire have not waked up to their possibilities or have not the brains to improve them.

On the Pacific coast they buy land at \$1,200 to \$2,000 an acre on which to raise apples to send clear across the continent and sell for big prices in your New Hampshire markets, and apples not so good, either, as you can raise right here at home.

Mr. Hale said he had seen very few respectable apple trees in New Hampshire, and scored some of his friends on the State Board of Agriculture for their neglect of their apple orchards, the best crop on their farms.

#### HOW TO SUCCEED.

He advised thorough tilling of the land; then the planting of new trees; a little pruning every year; spraying two or three times a year; careful picking and packing of the fruit. Perfect apples are wanted, and you in New Hampshire can produce them and ask your own price for them.

Mr. Hale told of a chance offered him a few years ago, which he did not take, to purchase half of a tract of two hundred acres of land in Oregon at \$100 an acre. Recently



half the tract was sold for fruit culture purposes for \$160,000, and the apples raised on it bring from \$2 to \$3 a bushel.

But after all, said the speaker, you have got to have apples and roses in your hearts in order to grow them perfectly as your orchards and gardens. If you had as lief sell lager beer as apples, don't go into the apple business.

Mr. Hale pointed out the great opportunity for profitable investment of New England capital in the fruit business and urged his hearers to employ coöperation to the same end.

He would be inclined to make it a prerequisite of marriage that the prospective husband should have an orchard and garden bearing fruit before he was allowed to take a wife.

The speaker cited a concrete instance of a Vermont fruit raiser who sold his Spy apples for twelve dollars a barrel, because they were absolutely perfect fruit of the highest quality, and closed with an appeal to his hearers to improve their farms and their fruit by the application of intelligence, industry, and patience.

#### AFTERNOON SESSION.

In opening the afternoon session, Chairman Roberts spoke briefly of the 59,324 farms in New Hampshire, the value of their products and the place of their owners in the life of the state; and introduced as the first speaker of this session His Excellency Henry B. Quinby, governor of New Hampshire.

Governor Quinby was cordially greeted and fitly phrased his pleasure in having a part in the exercises of the day and in meeting so many of New Hampshire's best people.

He said that, although he had been a member of the grange for many years, he did not think he had been invited to speak on this occasion with a view to giving advice on agricultural matters, and he did not feel qualified to do so in the presence of such an expert audience.

He spoke briefly, however, of the wonderful progress American agriculture has made and the fact that the farms are today the cornerstones of our great republic.

Wall Street, the monetary center of the United States, reflects daily the news from the farms, the price of securities rising and falling with good or bad crop reports. The future of the nation, for good or evil, is very largely in the hands of the farmers.

### GOOD ROADS.

As the main subject of his address Governor Quinby took good roads and particularly the construction of the three boulevards authorized by the New Hampshire legislature of 1909.

Of two million miles of highway in the United States, he said, only seven percent can be described truthfully as good roads, and it has been estimated that poor roads cost the people of this country \$12.50 a year per capita.

New Hampshire has done splendid work in the way of improving its highways, and the last legislature took the longest step yet in this direction. The governor expressed his opinion that the trunk line highways then provided for, with the intersecting roads that will follow them, will constitute one of the state's greatest assets.

The matter of laying out the routes of these boulevards, said His Excellency, has engaged the attention of the governor and council for several months and is before them still. It is not a matter to be disposed of lightly, for it means the establishment of important highway routes, for good or for bad, for all time.

"I believe the people will uphold us," said Governor Quinby, "in waiting until we are sure we are right before we go ahead."

Public hearings have been held and others are to be held until all who wish for a hearing in the matter have been given one. When all the testimony is in, it will be carefully weighed and a decision reached, not in accordance with what any single community wants, not with any political object in view, but with an eye single to the interests of the taxpayers of New Hampshire.

The availability of all routes proposed will be considered, the people they will serve, and their probable cost.

When we render our verdict to the people it will be with the full consciousness that we have acted in accordance with our honest convictions and our best judgment.

Many must be disappointed. These roads cannot go into every community and pass the door of every man who wants them. They must go where public policy, based upon availability, demands.

We have felt that it was better to be slow than to be sorry in this matter.

#### THE MISSION OF THE GRANGE.

For many years the order of Patrons of Husbandry has been represented on the Hampton Beach program by one of its prominent members, but seldom if ever has it had a better spokesman than on this occasion, when the subject, "The Mission of the Grange," was assigned to W. N. Giles of Skaneateles, N. Y., secretary of the State Grange of that commonwealth.

He sprinkled his remarks with new and apt anecdotes, which pleased his hearers greatly, and at the same time illuminated the serious points to which he was directing their attention.

Mr. Giles began by thanking the chairman for the courtesy of his introduction, in which allusion was made to the fact that New York state has 90,000 grangers, or three times as many as New Hampshire; but, said Mr. Giles, your 30,000 Patrons in New Hampshire average more than one to every farm in the state, a much better showing than our 90,000 make when it is considered that we have 300,000 farms in the Empire State.

The grange, however, knows no sectional lines; nor is its strength measured by mere numbers, great though its enrollment is.

Mr. Giles reviewed the previous addresses of the day, showing that the declaration of purposes of the grange includes

all the reforms and advance steps advocated by them, forest preservation and reforestation, coöperation, practical education, improved agriculture, and good roads.

As a concrete instance of the good work of the grange the speaker pointed to the new road law of New York state, and in the broader field of national legislation he cited much important legislation secured largely by grange influence.

"Educate and agitate" were the watchwords he advocated; getting all for the farmers that can be secured and then watching closely to see that nothing is lost of that which has been gained.

Mr. Giles declared that agriculture has not held its own in the great growth of the nation's industries; but he took no stock in the idea that this was the result of a conspiracy against the farmers.

"The other great businesses of the nation have been working and planning how to get ahead," he said, "while we have been standing still. It is our own fault and one of the missions of the grange is to remedy it."

#### OUR SUMMER RESIDENTS.

The splendid program of the day was brought to a fitting conclusion by Rev. Adolph A. Berle, D. D., of Boston, Mass., and Boscawen, N. H., who spoke upon "New Hampshire a Summer Resort State."

He divided the summertime visitors<sup>a</sup> to New Hampshire into three classes: those who come here merely for amusement and entertainment; those who purchase large tracts of land and shut themselves up within them, having no intercourse with the people of the state and no affiliations with them, and, third, those, generally of moderate means, or at least not wealthy in its modern significance, who buy New Hampshire farms as summer homes and make them homes in the real sense of the word. They become real parts of the community and devote themselves to its interests.

In return they are made, too often, the subjects of exploitation; a little is added to the regular prices of everything

which they buy in the vicinity, their taxes are unduly increased, and they are robbed in other ways. Doctor Berle gave some graphic illustrations, personal and otherwise, of this unwise policy on the part of New Hampshire people.

He said that his own location in Boscawen had been somewhat influenced by its good church and good schools, and he urged that New Hampshire towns should get good ministers and good school teachers and pay them enough to keep them.

The battles of the future, for farmers as for everyone else, will be battles of brains, and it behooves the farmers as well as all the rest of us to give our boys and girls the best equipment possible for these struggles.

As for the churches, the speaker said that a good minister in one pulpit for ten years would give his people the equivalent of a liberal education. He cited the instance of Boscawen, where Rev. Samuel Wood preached for fifty-three years and did an incalculable amount of good, including the pointing towards Dartmouth College of Daniel and Ezekiel Webster.

Doctor Berle paid an eloquent tribute, also, to woman as the mainstay of the rural home, and narrated striking instances from his own experience to this effect.

He quoted and endorsed the prediction of J. J. Hill that there must be a great movement back to the soil, because it will not long be possible for the one third of our population on the farms to feed the two thirds in the cities.

The speaker closed with an eloquent tribute of gratitude to the hills, the skies, and the magnificent environment of New Hampshire summer homes that grips the imagination and inspires the soul to grasp and conquer the great problems of the day.

Chairman Roberts said the benediction in the form of thanks to those present for their interest and attention and a warm invitation to come back another year.



## ANNUAL FIELD MEETING, 1910.

---

The twenty-fifth annual field meeting of the State Board of Agriculture was held at Hampton Beach on July 27, 1910, and surpassed in success all of its predecessors.

The day was sultry and oppressive in many places, but by the ocean cool breezes blew and the conditions for comfort and pleasure were ideal.

As in previous years the announcement of "Farmers' Day" at Hampton drew the people there from all parts of New Hampshire and from Maine and Massachusetts. It is estimated that there were ten thousand people on the beach during the day, but the great crowd was without exception distinguished for its good order, good nature, and good behavior.

It was a gathering of which the state of New Hampshire and the State Board of Agriculture had every reason to be proud.

The stated program of the day drew audiences that completely filled the spacious Convention Hall, both forenoon and afternoon, but for the thousands not thus accommodated plenty of amusement was provided with band concerts on the board walk, light opera in the theater, surf bathing, and the hundred other varied attractions of this famous resort.

Hampton Beach grows and improves with each succeeding season and deserves all the high favor which it enjoys.

### FORENOON SESSION.

With two exceptions, all of the members of the Board of Agriculture arrived at Hampton on Tuesday evening, the twenty-sixth, and held business sessions that night and on Wednesday morning previous to the public exercises of the day.

These began at 10.30 with music by the Hoyt & Parker orchestra of Portsmouth, which varied the program both morning and afternoon with frequent and spirited selections.

With these exceptions the exercises were composed entirely of solid speeches, and the way in which every seat in the auditorium was occupied to the finish showed the interest taken by the audience.

#### CHAIRMAN ROBERTS.

Hon. Joseph D. Roberts of Rollinsford, chairman of the State Board of Agriculture, called the meeting to order and congratulated his hearers upon the auspicious circumstances attending the gathering, both as regards weather and otherwise.

Looking back over the meetings held here at Hampton Beach, he declared that they had been a credit and an honor, as well as a benefit, to the intelligent farmers of New Hampshire. He referred to the organization of the state board, one member from each county of New Hampshire, and said that the various governors had been careful in their selection of appointees to see that they got genuine, representative farmers to serve on the board, men who know how to get up in the morning, milk the cows and hold the plow, to sow and to reap.

The chairman complimented the secretary of the board, Hon. Nahum J. Bachelder, upon the excellence of the program which had been prepared for the day, and said that he himself had obeyed orders for an introductory address of more than his customary length.

He said in part:

"Nearly forty years ago the first grange was organized in New Hampshire, and about the same time the State Board of Agriculture came into existence by an act of the legislature.

"During these thirty odd years, I believe, the board of agriculture and the grange working hand in hand have been potent factors in aiding and uplifting the agricultural inter-

ests of the old Granite State. Later on the Pomological Society and the Dairymen's Association were organized, and have rendered untold benefits to the farmers of New Hampshire. The farmer's occupation is peculiarly a solitary one. He is more alone in his business than the mechanic, the merchant or the professional man. He must be. They naturally collect in towns. His work must be carried on in the country. His land separates him from his fellows, and his opportunities to compare opinions, methods, and results must therefore be few in comparison to other pursuits. But the telephone, rural routes, the semimonthly meetings of the grange, along with the meetings of the several farmers' organizations in the state, and the fairs, all have tended to remove the isolation of farm homes.

"And while agriculture is not the leading occupation in New Hampshire it was half a century ago, it certainly is advancing with rapid strides to its place as an up-to-date and progressive industry, and the thirty thousand farmers in the state today are deriving benefits and pleasures far, far in advance of those enjoyed by our ancestors. They are better fed, better clothed, and better educated, and more thoroughly understand the work of the farm. The time has gone by when brawn and muscle are to do the work of the farmer. But intelligence, brains, must be the power behind the man that makes farming pay in New Hampshire.

"The farmer, then, should know more about soil than how to distinguish clay from sand and vegetable mould from either.

"He should understand the analysis of soils, in a certain degree. It has been said it is easier to rob the soil than to rob a hen's nest. What is the use of manures? Simply this: they supply the soil with chemical elements in which it is naturally deficient and of which it has been robbed. Manuring done right is a chemical process. Five dollars' worth of nitrate and sulphate of soda, mixed, is of more value to certain crops than ten times the amount of stable manure. Sometimes even a small amount of lime is enough to restore

an exhausted soil. The rotation of crops rests on the same scientific principle as that of manuring. The object is to give back to the soil that of which it has been robbed. Nature teaches rotation, for she practices it. Pine trees succeed oaks, and oaks succeed pines.

"I am quite well aware of the prejudice against science among the farmers who regard science as all theory, or a bundle of conflicting theories. But what is agricultural science but the recorded, digested and systematized experience of practical men? It is one thing more and better than practical experience, it is experience explained. There is something more valuable than facts—the reason of facts—and this science gives us. Theory or practice is lame, very lame, but practice without theory is stone blind. Agricultural science is nothing else than mind, yes, brains, put to use in farming, for it requires something more than hands and hoes, plows and harrows to farm well. It needs the human intellect.

"Every other pursuit has grown intellectually, why not agriculture? It is the oldest of arts but the youngest of sciences. Are we to plod on as our grandfathers did just because they did well. It seems to have been taken for granted that all agricultural minds might be poor, that there are no principles to be learned at the plow tail only practice. The best farmers of today are those who have taken to farming through love of the same and from an intellectual view of its true principles. Greatness of mind can be exhibited on a farm as well as anywhere in the world. And he is the best farmer who puts the most mind and the most valuable ideas into his farm management and his farm work. And the man or the woman that keeps the closest to Nature, that understands her needs, that understands her wants, whether it be of the soil or of the stock, of the orchard or of the hennery, that man or woman is bound to succeed, even in rock-bound New Hampshire. God never intended that New Hampshire should be an agricultural state in the broad sense of the word, but He has given us that

which is of vastly more importance than the rich alluvial soil of the Mississippi valley, the broad prairies of the West or even those lands to be found in the Golden Gates of the Pacific.

"Not many years ago a gentleman from Iowa was comparing the area of his state with that of New Hampshire. He spoke of the vast farms and great prairies, so smooth and level that the eyes could discern for miles away, and then disparagingly said he could not find a spot in New Hampshire big enough to make a decent cabbage patch for the average farmer in Iowa. The Yankee boy seemed dumbfounded at first, but quickly replied, 'If we could roll out our mountains and hills level as it is in Iowa we could have territory enough to not only cover Iowa and Illinois, but to take care of the larger part of Indiana.'

"But do we want to level these grand old hills and mountains, kissed by the sun, whose very beauty has drawn to its limits thousands of visitors annually, this Switzerland of America, that has brought at least \$15,000,000 into our coffers annually from our summer boarders. Do we want to level these hills and mountains, that rivers and lakes might no longer exist to be a power to turn the millions of spindles and other machinery in the cities of New England, and lighting the same by night, giving employment to thousands of operatives and their families, thus opening a market for our produce of every name or nature right at our doors? There is one thing better than getting near the market, that is, having the market itself brought near you. Where manufactures abound the farmer can combine his efforts for all the objects he desires. Here he can raise any kind of crops he wishes and a ready market is at hand. Do they, will they, the farmers, realize this golden opportunity before them? With the summer boarder business of \$15,000,000 or better in cash, with the demand of the people of our manufacturing cities, have we not as farmers something more profitable than the farmers of the middle West or of California are capable of obtaining? Farmers of New Hampshire, if you seek other



aids to farming, you must seek it in yourself. God and a sound mind are the best friends of all. You have a most noble and healthful pursuit. You come in contact daily with the grandest of success. No one need be dull as the clods he cultivates. You can make your business as intellectual as you please. You can draw from it the sublimest and most useful moral influences. Nature has done most everything for the New Hampshire farmer he could ask; if true to himself, his home might be the best and happiest spot on earth, if he remembers that the farm was made for the farmer, not the farmer for the farm; that if he gets nothing from his land for his intellect and his moral nature, he gets a sorry living indeed, never forgetting whatsoever a man soweth, that he also shall reap. There is always a seed time and a harvest. That if he has lived up to the enlightened, intellectual order of things, if he has a soul for the rural beauty and peace that surrounds his home; that if he believes the right cultivation of the farmer himself is of more importance than the right cultivation of his farm; that the care and breeding of his children is better than the breeding of his cattle, if his family rise up and bless him in his labors, then he may be the happiest of men." (Applause.)

#### STATE MASTER PATTEE.

In introducing Richard Pattee, state master of the Patrons of Husbandry, to speak for "The Grange in New Hampshire," Chairman Roberts said that the grange was an organization of which agriculturists should be proud and to which every farmer should belong.

Mr. Pattee gracefully acknowledged the compliment in behalf of his order, which, he said, is always and everywhere allying itself with good causes. The church has a good friend in the grange, the teachings of which lead to morality and right living and exercise a good influence in some places where the church is almost a minus quantity.

The schools of the state, too, have a powerful friend in the grange, which stands for better schools and more of them.

It deserves much of the credit for the advanced educational legislation of the recent past in New Hampshire.

The grange stands for good roads, for better roads, all over the state; and it is, of course, especially interested in improved transportation facilities in the rural sections of our state.

The grange has coöperated and will coöperate with the State Board of Agriculture in the latter's educational endeavors. Almost without exception, the board's farmers' institutes are held under the auspices of some subordinate grange which plays a large part in their success. The attitude of the grange towards the board is one of friendship and support.

The state master illustrated humorously the difference in meaning between "satisfied" and "contented," and said that while the grange in New Hampshire is satisfied with the splendid work it has accomplished in the past it is not contented with present conditions, but will work steadfastly for their improvement.

The activities of such organizations as the church should be so systematized as to avoid duplication of effort in some places and an entire absence of such influences in other places. Some parts of New Hampshire are overchurched today and others are underchurched.

We shall not be content until our school system takes more account of the ninety percent of our boys and girls who do not go to college and furnishes them with an education better fitting them for the duties of after life; an education which fits the farmer for the farm rather than to leave the farm.

We shall not be content with our roads until the boulevards we are building reach every country town and the farmer himself enjoys the roads for whose building he is taxed.

We shall not be content with the State Board of Agriculture until it extends further its educational work and holds more than two institutes a year in each county of the state. That is not enough.

There is almost no limit to what the men and women, boys and girls, upon New Hampshire's thirty thousand farms can accomplish, if they will join with the grange in active, earnest, intelligent work. The grange is today a tremendous force for good. It will become an almost irresistible force for progress if it is properly conducted and loyally supported. Such conduct and such support mean better granges, better farms and better farmers in New Hampshire.

#### AARON JONES OF INDIANA.

The next speaker, though from the distant state of Indiana, was a familiar figure to most of those present, and was introduced by Chairman Roberts with the reminder that like old books and old wine old friends are the best. Many times we have heard the voice of Aaron Jones, master of the State Grange of Indiana and past master of the National Grange, and the more we hear him the better we like him.

Mr. Jones, speaking for "The Grange in the Country," began with highly complimentary allusions to the audience which he addressed and the state which it represented. During the eight years which he served as master of the National Grange he visited all the states in which the order is organized, and from his observation then and at other times he was confident that in no state has the board of agriculture done a better work than in New Hampshire. Able and energetic, it has worked wonders in forwarding the material interests of its state.

Here, as it should be everywhere, the State Grange and the State Board of Agriculture work together for the advancement of home and farm, for raising the intellectual and moral status of the people of the farm. New Hampshire's record in this respect has furnished an inspiration for grange work in all parts of this country.

Mr. Jones said that he and Samuel Adams, now of St. Paul, Minn., are the only surviving past masters of the National Grange, and that in a recent conference they

agreed that the progress of the grange had been far beyond their fondest dreams and liveliest expectations.

In this connection the speaker paid a splendid tribute to the work of the present national master of the grange, Nahum J. Bachelder, of New Hampshire, and his words were warmly applauded.

Better work, freighted with better results, has not been known in grange history, said Mr. Jones, than during the administration of Brother Bachelder. Forceful, yet conservative, he has encouraged every good move in the way of progress, and when the history of the grange is written the accomplishments of his administration will stand unrivalled.

We of the grange, continued Mr. Jones eloquently, work for the improvement of the farmer on the farm; for the benefit of the locality in which we live; for legislation which will be for the good of all the people. There is room for all legitimate industries in the life of this grand nation of ours, this country without an equal. All the grange asks is a fair and square deal, an equal opportunity with other industries.

No organization—I do not now consider the church—has ever accomplished so much for the common people of this country as has the grange; and its great and good work will go on and on until agriculture will be justly recognized among the sciences and the farmer take his rightful place as a scientist, a mental as well as a physical laborer.

Then our organization will be perfected. The resources of the soil will be observed. The products of the farm will be increased to meet the growth of population, however great that may be. We will double the agricultural product of today at one half its present labor cost.

Every industry recognizes its dependence upon agriculture. Every leader of finance scans eagerly his newspaper to learn of the condition of the crops. From the brown soil comes the golden stream that fills the arteries of commerce.

The time will come when we will have an agricultural school and an agricultural experiment station in every

county of every state in the union. We will have a less expensive and more productive government, a government which gives the taxpayer greater return for every dollar which it asks from him.

And in attaining all these ends the grange will help.

HON. WILLIAM E. CHANDLER.

In introducing the last speaker of the forenoon session, Hon. William E. Chandler, Chairman Roberts said that Mr. Chandler's reputation was not only national, but international, that his name is known as far as the sun runs its course.

Mr. Chandler was warmly greeted and introduced his remarks by an expression of his pleasure at being on the same platform once more with his old friend, Hon. Aaron Jones.

Mr. Chandler said that he always prepared for attendance upon these meetings at Hampton by some actual work in the hay field, which, this year, was done under exceptional circumstances.

An old farmer friend, he said, died the previous week at Waterloo at the age of eighty-one years. He had been a hard-working man all his life, said Mr. Chandler, and owed no man a dollar; but, on the other hand, no man owed him; and all he left after his long life of labor was the little farm upon which he dwelt.

On Monday of this week, without formal notice, almost by instinct, the neighbors gathered in this man's field and gathered his hay into his barns as he had done for so many years. That was my preparation for this meeting of today, said Mr. Chandler.

Then, passing from grave to gay, he said that upon arrival at the hay field he found the sun so hot that he concluded he could do his part of the work better by scientific direction, so he sat himself down under an umbrella in the middle of the field and took charge of operations from that point.



That is the sort of assistance from scientific farmers of which you real farmers have enough and to spare, said Mr. Chandler, while the audience laughed. What you really need is something else, and this he laid down in the form of the following propositions:

I. Farmers sell their products in full competition and never in combination with each other, or as part of a monopoly, and never receive more than a small fraction of the prices paid by the ultimate consumers.

II. The prospects of the farmers are growing worse by reason of the organization of corporations dealing in food products which destroy competition, create food monopolies and fix their own prices, making them low to the producers and high to the consumers—all as part of a vast modern system of corporation monopolies, in all departments of human industry and huge private fortunes of the malefactors of great wealth, which system as a part of its plan is taking possession of all politics and all government, state and national.

III. The remedy of the farmers should be organization on their part, in connection with laborers and consumers to destroy the evils of corporation monopolies. Wherever competition cannot be secured by the repeal of monopolistic legislation there should be complete governmental control and regulation of the corporation monopolies and a governmental protection of both producers and consumers; and to secure these ends the control of the conventions and the elections and of the office holders must be taken away from the money power and returned to the people.

For this purpose the farmers, the laborers and the consumers must coöperate by the organization of free and unpurchased unions of citizens.

IV. The laws of congress and of the state legislatures should forbid capitalized industrial corporations and railroad corporations to combine in suppression of competition.

On the other hand, however, farmers' unions, labor unions, and consumers' unions should be allowed to make and main-

tain combinations to secure to these classes respectively their just rights to fair prices for products, fair wages for labor, and no extortion in the ultimate prices to the consumers.

The reason for this discrimination is that corporations have in their ownership and possession vast sums of money—vast capital—while the farmers, the laborers and the consumers have substantially none.

Mr. Chandler developed in most interesting manner each of the points outlined above and was interrupted frequently with expressions of approval. He quoted remarkable figures and comparisons to show how small a share of the value of the products of the soil is gained by the producer and how much goes to the middleman and the combinations.

Fictitious capitalization and the robbery of the people by its means must be stopped, said the speaker. A revolution in this regard is going on today and will go on tomorrow. It has entered and will enter into politics.

The economic systems of this country, the economic control of this country has so far passed into the hands of men of great wealth that we are likely to have anarchy and socialism rampant if the people do not do their duty at the polls.

We must remove all that restrains competition; we must destroy monopoly; this we must do through the governmental control and regulation of corporations. Competition once solved these problems, but soon it will be gone forever unless a change is brought about in favor of the consumers.

We must elect men to office who will fix their attention upon this serious question and set right this great evil. It can be done. Fifty years ago a Southerner told me that human slavery never would be destroyed in this country in my lifetime, but only a few years later it was blotted out forever.

I know that industrial slavery, too, will be abolished in this country, and I want to see it done in my lifetime, said Mr. Chandler in closing, and his hearers applauded the sentiment heartily.

## AFTERNOON SESSION.

Dinner was served at noon to the members of the Board of Agriculture and their guests in the private dining-room of the Casino. Governor Henry B. Quinby, attended by his military staff, arrived at noon and was the first speaker at the afternoon session, being introduced in highly complimentary terms by Chairman Roberts.

## GOVERNOR QUINBY.

His Excellency began with a jocular reference to his interest in agriculture and his regret at missing the good advice to farmers given at the morning sessions by such scientific experts on the subject as former Senator Chandler.

Voicing his pleasure at being present Governor Quinby called the attention of his audience to the historic grounds near by, Newcastle, where took place the first overt act in the War of the Revolution, and Exeter, the seat of the state government in revolutionary days.

The body of the governor's address, however, concerned itself with two phases of state government at present of great interest to the people of the state, the construction of the addition to the state house at Concord and the progress of work on the system of state roads. In regard to these matters he took the audience into the confidence of the administration and gave very interesting facts and figures as to the progress made up to the present time.

The addition to the capitol, he said, which will be larger than the original building, will cost \$400,000 and will be ready for occupancy the last of September, some months in advance of the time fixed for its completion. It is a beautiful structure and one in which the state can take pride.

To provide for its erection the legislature of 1909 authorized a bond issue of \$400,000, but we will pay every bill as it is presented and not issue one dollar in bonds for that purpose.

My only regret, said the governor, is that it was not decided to raze the old structure entirely to the ground and build anew to correspond with this addition.

Taking up the subject of the state roads, Governor Quinby read a statement prepared for the occasion by the state engineer, showing that something more than \$1,000,000 will be spent in New Hampshire this year in the permanent improvement of main highways. Forty miles of state road will be built this year.

"And I can assure you taxpayers," said the Governor, "that you are getting a dollar's worth of work for every dollar of your money that is being spent on the state roads and the State House."

Another position taken by the governor which pleased the audience greatly was in relation to automobiles and the roads. "If the owner of a high power automobile wants to 'get there' in a hurry over our good roads," said the Governor, "he should be made to pay for the privilege. The man who can afford to own a 60-horse power car can afford to pay a good tax for it. It is a luxury."

Every piece of good road is a distinct benefit to the farmers of the state, argued the governor, but to get the most good from them these roads not only should be intelligently constructed, but supervised and kept in repair with the same care. He argued briefly but cogently for a centralized control of the state highways, an expert supervision which would eliminate the third of waste due to the present condition of desultory and disorganized repairs.

In closing he expressed the hope that those present would aid in securing legislation which would make good roads and keep good roads, not for the tourists alone, but for our own people, who after all use the roads the most and obtain the most benefit from their good condition, their careful, economical, intelligent construction and maintenance.

HON. R. A. PEARSON OF NEW YORK.

Hon. R. A. Pearson, commissioner of agriculture of the state of New York, spoke informally, but most interestingly, upon "The Agricultural Outlook."

He began felicitously with the statement that both New

York and New Hampshire are fortunate in the quality of their governors, good men who are interested in good agriculture. Each state has many farmers among its leaders in public affairs and is to be congratulated on that fact.

Mr. Pearson was armed with more statistics about the farms of New Hampshire than most of his hearers knew, and he told them that New Hampshire has 30,000 farms with more than a million acres under cultivation, representing an investment in agriculture of \$85,000,000 and producing annually dairy products worth five and a half millions dollars and other agricultural products to the value of \$16,000,000.

The agricultural outlook and its problems, he thought, were much the same in New Hampshire as in the larger state of New York.

Ten, twenty, thirty years ago throughout New England and New York wheat was selling at 50 cents a bushel, hay at \$5 a ton, milk at a cent a quart. Farming land sold at \$10 an acre. The rural population was slowly decreasing.

Why? In response to an economic law. Uncle Sam was opening up the great West, giving away good farms. New England and New York lost many of their best farmers then. Other men were called from the farms by the tremendous demands for men caused by the world's greatest period of railroad construction and industrial development. Wages went up so that men were attracted from the farms and gave the manufacturers the world's best labor.

Thus the chief burden of our national development fell upon the farms of the East.

Now things have changed. Optimism is in the air of the agricultural sections of New England and New York. The product of an acre of land today is worth double what it was a few decades ago. Farms long in the market are selling for twice what has been asked for them before.

Business men and professional men are buying farms because they see the opportunities there are in agriculture in this section.

Horace Greeley said, "Go West, young man," but that



advice is good no longer. Authorities agree that it is in the East that the young man of today will find his best opportunities. We of New York are advertising far and wide the chances for success upon our farms.

We point with pride to the thousands of New York farmers who have gained and are gaining wealth and prosperity from their calling.

There are still a goodly number of farms for sale cheap in the East, but the price is slowly rising.

The farms of the East have the world's finest markets.

Here is the educational system best adapted to the farmer and his children.

Here are the laws most in his interest.

Immigration from the West to the farming districts of the East has begun and will continue. It is becoming generally recognized that farming in the East is today a business proposition with a bright outlook.

Mr. Pearson closed with a brief statement of what he considered the greatest problem of today upon the farms, the exhaustion of their soil fertility because of our national wastefulness.

Civilization has moved from the East to the West, he said, because agriculture has moved from the East to the West, and agriculture has so moved because of the exhaustion of the soil. But now we have encircled the globe, there are no new lands for cultivation, and, instead of moving, we must plan in some way to save and restore fertility.

HON. WILLET M. HAYES.

The concluding speaker of this very successful meeting was Hon. Willet M. Hayes, assistant secretary of the United States department of agriculture, whose subject was "The Organization of Agriculture."

His address was illustrated with elaborate charts and without their reproduction it is impossible to give a full idea of his remarks or to indicate the degree of interest which they aroused in his audience.

Mr. Hayes said that now we hear the call to the farm, the call for good folks on the farms, the call for a period of construction in agriculture.

We must revitalize our rural communities by a general reorganization of our school systems, our economic, social, and religious affairs in rural sections. We have not put enough thought and research upon this problem of how to reorganize all these departments of life of our farm folks.

But we have come to see that the family farm is the most vital part of our social organization.

Mr. Hayes first showed with his charts the distribution of agricultural high schools and colleges in the United States and enlarged upon the necessity of providing courses for the boys and girls which will keep them on the farm, fit them for the farm, make them satisfied and prosperous on the farm.

Agricultural education must be adapted, also, to the boys and girls from twelve to eighteen years of age so as to keep them at home, to keep them in school later, and to help them get more out of their school attendance than they now do.

Very interesting charts showed the old conditions in the middle West as to the location of country schools and the improvement that has been brought about by the consolidation of rural schools. Not one unsuccessful school of this type has been reported, said Mr. Hayes, and he did not believe that five percent of the people among whom the experiment has been tried would vote to go back to the old system.

This new departure will wipe out ignorance, isolation, and lack of organization. If we are to escape socialism, said Secretary Hayes, we must preserve individualism, and to do that we must have coöperation.

Detailed plans for a model rural schoolhouse costing \$10,000 were shown, though the speaker said that the cost had run as high as \$25,000 in some built in Indiana and other states.

The speaker dwelt briefly upon the part which the church

and such organizations as the Y. M. C. A. may play in the reorganization of rural life.

In the matter of transportation it is now the turn of the rural roads, he said, and the American people will see to it that they are made good if it takes billions of dollars to do it.

More scientific methods of agriculture will bring the larger yields which we must have. We cannot increase much our acreage, but we can and must increase the yield from those acres.

The farmers must organize—not against the people of the city whose help we may need—but for our own advancement and advantage.

# SUMMER HOMES.





## SUMMER HOMES.

---

BY H. C. PEARSON.

It is probable that the year 1909 saw at least as many farms in New Hampshire purchased by people from without the state as any previous year. The State Board of Agriculture, from such information as it has been able to gather, places the number of such purchases at rising three hundred, and it is certain that a careful census, if there had been facilities for taking one, would have added very materially to the list.

Not all of these farms were purchased with the idea first in mind of a country home for rest and recreation, though without doubt this was the motive at the bottom of a great majority of the transactions. But, as will be stated more at length later, not a few farms were bought with the purpose of making them financially profitable through one or another of the varied branches of agriculture.

On the other hand, some of these farms, especially in the lake country, were bought for development by modern real estate methods, division into lots, building of bungalows, etc.; so that the number of three hundred farms sold undoubtedly represents an even larger number of summer homes added to the state's list.

The secretary of the State Board of Agriculture has received several requests for statistics as to what the so-called "summer business" amounts to in money to New Hampshire. This is impossible of exact calculation, but estimates have been made, based on such information as he could secure in various ways, that \$15,000,000 is spent in this state every year by those who come to it because it is the "vacation state" par excellence of the Union.

This includes those who own country homes in New Hampshire and spend from three to nine months of every year in them; those who rent houses for the season; those who are season guests at hotels and boarding-houses; those who spend their vacations, a week, a fortnight or a month, in New Hampshire; and the grand army of "transients," railroad excursionists, automobile tourists and pedestrians.

When the manifold needs of all these classes are taken into consideration and inquiry is made as to their average expenditures with representatives of the different dealers with whom they must do business, the figures given seem conservative.

What might be called the permanent investment of our "summer folks" in New Hampshire, that is, the amount expended in the purchase of farms and building lots and the erection of bungalows, cottages, villas and farm buildings upon them, is estimated to average \$2,000,000 a year.

Every year sees the transfer of many "transients" into the permanent list, and in 1909 New Hampshire gained in this way such desirable residents as ex-Governor David R. Francis of Missouri at Rye Beach; Edwin D. Mead, international peace advocate, at Chesterfield; Edward F. Webster of Stone & Webster, Boston, at Lake Asquam; Judge Henry E. Lazarus of New Orleans, at Mont Vernon; Dr. Thorne Shaw of New York, at Bethlehem; P. P. Caproni of Boston, at Salem.

It was a summer resident of many years' standing, however, who caused the most publicity for New Hampshire as a vacation state in 1909, by reason of his appointment to the cabinet of President Taft as secretary of the treasury. Reference is had to the Hon. Franklin MacVeagh of Chicago, Ill., and Dublin, N. H., now also of Washington, D. C.

It is twelve years now since Mr. MacVeagh, searching for a New England town where the air was dry and bracing, found Dublin and settled there. The town of Dublin averages 1,496 feet above the sea level, and the MacVeagh estate, located on the eastern spur of Mount Monadnock, is considerably higher. The mountain view from it is one of the

most magnificent in New England, reaching to Mount Wachusett in Massachusetts.

Secretary MacVeagh and his family spent their first summer in Dublin as hotel guests, but so eager were they to occupy their own estate that the next summer found them settled in one of the farmhouses on their recently-purchased acres, pending the completion of the summer home they had planned.

It is said that the plans for this home were in the first place simple, but they grew and grew until today the MacVeagh summer residence represents an outlay of \$100,000. The estate, also, has been enlarged from time to time, until now it includes over four hundred acres.

While at Dublin Mr. MacVeagh rides and drives a great deal and his stable of fine horses is famous, while this estate is one of the few places in New Hampshire where pony polo is played. He has a herd of thoroughbred Jerseys also, and his vegetable and flower gardens hardly can be surpassed in the state. More than that could be said of his rhododendrons, his favorite flowers, which are said to equal the finest grown in this country.

Secretary MacVeagh is popular among his Dublin neighbors, whether they are fellow millionaires from the great cities or New Hampshire farmers of the all-the-year-round variety. One of many reasons for this is found in the fact that the only baseball diamond in Dublin is located on the MacVeagh estate and is kept in excellent shape for the use of the young people of the village.

Mr. MacVeagh did not allow his official position to cut short his vacation in 1909, but rather stayed in Dublin until his personal presence in Washington was absolutely necessary, in the meantime considering the problems of his department in the quiet of his beautiful estate and summoning there his associates and assistants for consultation and receiving visits from some of his associates in the Cabinet.

This made Dublin something of a political center, but the

sensation was not a novel one for the hilltop village. One of its best beloved summer residents, the late Ethan Allen Hitchcock, was secretary of the interior under President Roosevelt. Dublin shared with Winnepesaukee, too, the favor of the late Count von Sternburg, German ambassador, and was the seat of the German summer embassy in 1907.

At that time the ambassador wrote, for publication in "Summer Homes":

"You want to know why I chose New Hampshire as a summer residence for the German embassy? I did so on account of what I had been told about its mountain and lake scenery and its excellent climate. All I can say is that my anticipations were greatly surpassed. I have seen a good deal of the world but I have seen no spot with which The Weirs could not hold its own, even in Scotland and the Bavarian highlands. The summer my family and I spent on Governor's Island will certainly remain a delightful souvenir, and we shall always remember the courtesy of the people of the state with whom we came in contact."

Another summer embassy of recent years in New Hampshire was the British, in 1907, when the Right Honorable James Bryce occupied the beautiful estate of Rev. Dr. Daniel S. Merriman at Intervale. At the close of that summer Mr. Bryce wrote to the editor of "Summer Homes".

"Mrs. Bryce and I cherish the most delightful memory of our summer and autumn in New Hampshire, of its rocks and woods, its clear, bright streams and its majestic summits. Neither shall we forget the kindly welcome we had from our neighbors in the lovely valley of the Saco. We wish all happiness and prosperity to the people of the grand old Granite State."

That Mr. Bryce still retains this pleasant impression of New Hampshire was plain from his eloquent address of last September in Hanover on the occasion of the inauguration of President Ernest F. Nichols of Dartmouth College when he said in part:

"It appears to me that a large part of what Dartmouth has been able to achieve through the distinction of its famous graduates must have been due to the stimulating influence of your air and scenery. I don't know that I have ever wished more to be an undergraduate again so that I might go out on long walks with friends through these romantic valleys, these lovely woods and to these hilltops, from which you get such charming prospects up and down the valley of the Connecticut river. Being taken today to the top of your observatory, I looked out to the east and saw a most beautiful ridge, partly wooded, partly showing glades and open slopes of sunny pasture, and I asked whether that belonged to the college. I was told that it did not yet belong to Dartmouth College, but that it was likely some day to belong to it. I cannot help feeling that if I were a resident here there is nothing I would try more to do than to secure the possession for Dartmouth College of that beautiful piece of hill and wood, because I don't think there is anything that contributes more to the joy of undergraduate life than having around you places where you can ramble between the intervals of your studies and can draw peace and joy from the sights and sounds of Nature."

In the distinguished company gathered for that inauguration were many summer residents of New Hampshire, as was naturally to be expected. One of them, President John H. Finley of the College of the City of New York, made the trip to Hanover from his country home in Tamworth, on foot, and the story of his experiences, accompanied by his portrait in marching uniform, would be a most interesting contribution to the literature of the road.

At Tamworth President Finley is the nearest neighbor of Mrs. Cleveland, widow of the former president of the United States. At the time of establishing his summer home on this New Hampshire hilltop President Cleveland wrote to the secretary of the State Board of Agriculture:

"The beautiful mountain views on every side, the deliciously cool atmosphere, the pleasant rambles and rides, and



the charming lakes and streams within reach make a complete list of attractions, while a fair measure of remoteness from the distractions of crowds and business and social activities fittingly emphasize them all.

"Besides all this, the people native to the locality are fair in dealing, accommodating, and, above all, have sense enough to understand that the people who come here for rest and quiet and their own kind of vacation do not need officious volunteering of attention or uninvited interference, and yet they seem always ready to do what they can to make the summer resident's stay comfortable and pleasant.

"I think it is the combination of all these things that makes a summer's stay in New Hampshire so alluring.

"I find it a subject of unanimous congratulation in our family that by the purchase of the Tamworth farm we are fairly anchored as summer residents in the state of New Hampshire."

A number of Mr. Cleveland's friends, Mr. Gilbert Colgate, 55 John street, New York City, acting as treasurer, have planned a memorial for him in the unique form of a road up his Stevenson hill in Tamworth. As President Finley said in an address at the Bretton Woods Forest Conference last August:

"The little stretch of road of which I am to speak especially this morning, while it has all the practical, democratic, social significance of the generic road, has a meaning and an appeal beyond this. It is to express in still another and homely language (which even those who run in their swift cars or ride in the skies can read) admiration and affection in this generation for the man who gave an honest, courageous body to the spirit of democracy, who loved his home, his people, and the out-of-doors; and it is to help keep in mind of coming generations his service and his rugged virtues that this honest memorial to him is planned here among the 'White Hills' of New Hampshire, where, after his battles were nearly over, he sought healing and rest.

\* \* \* \* \*

"This road has sight of the mountains; on one side the Sandwich Range, Chocorua, Paugus, and Passaconaway! on the other, the Ossipee Mountains; beyond the valley between the two, the mountains of Freedom; and in the dim distance, still beyond, mountains in Maine. There is a brook within sound at the foot of the hill just behind the trees at the entrance to the road; and there is a glimpse of one of New Hampshire's beautiful lakes at the top of the hill where the road comes again into the old road which it left at the foot. It is only a third of a mile in length, but it has all the variety of New Hampshire view which a longer road might covet.

"Mr. Cleveland himself had the road built, and he took a great interest in its construction. At an Old Home Week gathering the summer after it was made he said in a half-humorous vein: 'I anticipate there will be (a hundred years hence) a highway winding with easy grade around the steep on Stevenson Hill, which for a century will have made less strenuous the toil of man and beast. Perhaps, according to the new standards of honorable mention I have suggested, it may not be thought amiss to recall the fact that I laid out and constructed it.' And it has one of the prominent characteristics of all his own work. It goes straight up the hill. The old road was tortuous. This climbs straight up to where it must turn to join the old road, just beyond his home.

"It is this road which we wish to improve, to fence with stone walls, and to keep always as the 'Grover Cleveland Memorial Road,' marking the entrances to it with granite boulders bearing his name.

"There is one added feature of this memorial which will be of special appeal to those who are gathered here this morning—the planters, preservers, and lovers of trees. It is proposed to plant trees the length of the road. This is appropriate because he—this great, giant-framed man with a heart of oak—was as tender of trees as he was gentle toward children. One of his last occupations was the planting of elms and maples and birches. In his last years he built a camp

by a New Hampshire lake a few miles from his home, and named it 'Acorn Lodge,' and one of his chief satisfactions there was that he could hear at night the acorns dropping on the roof."

At the annual dinner for 1910 of the New Hampshire Society of New York President Finley made another speech too good to escape quoting here. He said:

"A lad of five in my family, who bears my name and is said to resemble his father, but boasts New Hampshire ancestors, as I do not, inquired of the New Hampshire and better half of his immediate ancestors a few weeks ago why it was necessary to come back from New Hampshire to New York. It was explained in a proper maternal way that the father had to stay here in order to procure the means of livelihood. After a few moments' reflection the lad asked: 'But why can't he find something to do in New Hampshire?'

"My son has too high an estimate of his father's ability. He mistakenly believes that his father has brains enough to earn a livelihood even on the sterile hills of New Hampshire. Anybody can earn some sort of a living on the fertile prairies of Illinois; almost anybody can eke out an existence even in the snow-banked or granite-blocked streets of New York; but it is only an agricultural genius or a horticultural Burbank or a superhuman patron of husbandry who can make two blades of grass grow in those granite fields, where but one or none grew before; who can produce a hundred bushels of wheat for less than it would cost to import as much from Minnesota, who can get enough from grafting an edible apple on a crabapple tree to justify this horticultural bribe to nature, or who can raise enough small grain to make it profitable to feed chickens that would lay eggs of the sort advertised at seventy-five cents a dozen in New York. Gentlemen, I am sorry that my boy must grow up to learn that I am only an ordinary man, that I could not make a living on a little farm in New Hampshire, that I belong to that multitude represented here tonight who had to emigrate from New Hampshire to live, or who, living in New York, can afford

to stay in New Hampshire only a part of the year. It is said that what New Hampshire needs is more fixed nitrogen in the soil—if it may accurately be said to have any soil, except in spots—but what New Hampshire really demands of those who stay victoriously there is men whose brains are fed on nitrogenous food; those who cannot meet that demand emigrate or æstivate, or wither, or die.

“I have a friend who lives winter and summer on the top of one of those granite-built hills, equipped with one of the best pair of brain lobes that I know. My summer friends think it a pity that he has not come to New York. He would be a great man here. But I contend that his satisfactions are for the most part of a higher order than those of nine tenths of the people who are living in New York. He came down here once last winter, rode in the subway, went to the theater, had supper at one of our Delmonicos, but I am not sure that he had any satisfactions higher than those which come to him as he gathers sap by day from his maple trees and reads his Shakespeare, his Victor Hugo, and his Emerson by night. I remember riding through an avenue of shops here one day last summer and counting the stores which furnished articles entirely superfluous in that man’s life. I’ve forgotten the statistics, but I think at least two thirds of them were unnecessary. If we could only lead a simple granite hill life in a Murray Hill environment, how much happier and healthier we should be, and how much cheaper eggs would be!

“I said the other night at the Dartmouth dinner that every student should be required to take a laboratory course in New Hampshire geography. My son’s great-grandfather used to walk across the state of New Hampshire to Dartmouth College, and my son’s father (partly not to be outdone by his son’s New Hampshire great-grandfather) made the same journey a few weeks ago. I should like to propose a like condition for membership in this club, and I should insist that the journey should not be made at the upper end of the state,—in Coös county,—or if so that it should include enough of a lateral journey to make at least fifty miles

—for I know nothing more enjoyable and invigorating in all recreation, indoor or outdoor, than a long walk across the mountains and hills of that state of trees and brooks and stones. To one who has the faculty of the melancholy Jacques of finding sermons in stones, books in the running brooks, New Hampshire has the best pulpits, preachers, and libraries in the world. And as for the scenery, I am not surprised that Switzerland has been called ‘the New Hampshire of Europe.’ I wish the New Hampshire Club in New York, instead of sitting here in New York, contentedly eating more than is good for it, could spend some effort in improving the train service for getting out of New York, through Connecticut and Massachusetts and into New Hampshire more quickly. For whatever brings what New Hampshire has to give nearer to New York City is (whatever it be to New Hampshire) a blessing to New York. New Hampshire may lack fixed nitrogen in her soil, but she has oxygen fixed in her atmosphere and her ribs are of granite. The sign which I saw over a scythe-stone mill last summer might well be written across the state, ‘We make anything that has grit in it.’

“I often recur to a thought which came to me summer before last when I was building a stone wall on my New Hampshire hillside. I fell to wondering what would have happened if Deucalion and Pyrrha, who were told, as you recall, to take the bones of their mother and fling them over their shoulders as they ran, and so repeople the earth,—I have wondered what would have happened if they had started to repeople the earth in New Hampshire instead of on a mountainside in Thessaly. Would the progenitors of the human race have given the world a different history if they had made the earlier men of New Hampshire granite instead of sandstone or clay or some other more friable substance? Would Judge Howland have been Aristides the Just, and, alas! would Aristides have been just Judge Howland? Would Greece have had her Webster and New Hampshire her Demosthenes? Would Horace White and Socrates have exchanged places? Would the Merrimack, instead of turning



the greatest number of spindles in the world, be the inspiration of the greatest number of verses? I always end such reverie with a thought of its footlessness. But I can't help thinking and saying that New Hampshire, like the ancient Deucalion and Pyrrha, has been flinging from her hillsides down into the valleys granite characters that are to spring up into men—men who will conquer all the ways to the seas.

"So I say to New Hampshire, godmother of my sons: 'Go on with the stone-flinging—if this is the sort of men your granite-builders grow into; but leave a few in the fields up there.' We are building a road out under the New Hampshire skies in memory of that great, courageous-souled, granite-willed former president of the United States, Grover Cleveland, who went up there to spend some of his last days, his battles over. And along that road we are building a wall of granite boulders. I hope enough will be left for that and that every one of you will wish to put a boulder in it. But for the rest, O New Hampshire, turn your face toward the north, toward the sources of the Androscoggin, and throw over your beautiful shoulders what they symbolize down your valleys till there are granite men in all these urban moraines as there are granite rocks on the Franconian Mountains."

This Forestry Conference at Bretton Woods was one of a number of important national gatherings held there during the year, such as the conventions of the American Society of Civil Engineers, the Association of Librarians, etc. The number of such meetings is likely to increase in coming seasons as the advantages which our state offers for them become more widely known.

The beautiful estate at Dublin of the late Secretary Hitchcock, to which reference has been made, was not occupied by his family in 1909, but was leased to Mrs. Marshall Field of Chicago, who had as her guests during the season Senator Albert J. Beveridge of Indiana and his family. Senator Beveridge always is a center of activity, even in his vacation days, and one of the fruits of his Dublin stay was the

organization of a local Child Labor Society, to work against this evil of our modern industrialism.

Among other visitors of the summer to New Hampshire were Admiral Uriu of the Japanese navy and his wife, an American girl, who were entertained at the picturesque and unique lakeside home of Miss Alice M. Bacon, the author, at Asquam.

President Taft did not come to New Hampshire for his vacation, as the state had hoped he might, but the location he chose, on the "North Shore" of Massachusetts, was a part of the same beautiful curving coast to which belongs our state's sea strip of eighteen miles of marvelous beauty.

The New Hampshire legislature of 1909 took account of the state's summer home interests in not a few of its enactments. This was notably the case in its authorization of a million-dollars bond issue, the proceeds of which will be used for the construction of three main highways from the Massachusetts state line in Coös county, up the east and west sides of the state and its center. Forestry, fish and game, and automobile legislation of the session also was designed to add to the attractions of the state for the summer resident and visitor.

The route of the three highways so established was a subject of great interest throughout the state. The governor and council, to whom the legislature gave the authority to designate the towns to be traversed, did not act in the matter until they had gone over in person the different routes advocated, and had held public hearings, at which many citizens appeared and were heard. The final decision of the governor and council in the matter was applauded generally as for the best interests of the state.

By its terms the East Side road will begin at the boundary line between Seabrook in this state and Salisbury, Massachusetts, and will run through Seabrook, Hampton Falls, Hampton, North Hampton, Rye, Portsmouth, Newington, Dover, Somersworth, Rochester, Milton, Wakefield, Ossipee, Tamworth, Albany, Madison, Conway, North Conway, Bartlett,

Jackson, Lincoln's Grant, Green's Grant, Martin's Location, Gorham, Berlin, Milan, Dummer, Cambridge, Erroll, Millsfield, Dixville, and Colebrook. From Seabrook to Portsmouth the ocean boulevard, constructed by the state, will be utilized as the first link.

The Merrimack Valley road will commence at the Massachusetts state line, on the southerly boundary of the city of Nashua, and will run through Nashua, Merrimack, Bedford, Manchester, Hooksett, Allenstown, Pembroke, Concord, Boscawen, Franklin, Tilton, Belmont, Laconia, Meredith, Center Harbor, Holderness, Ashland, Bridgewater, Plymouth, Camp-ton, Thornton, Woodstock, and Lincoln. In the latter town it will connect with the state road running to Twin Mountain.

The West Side road will start from the Massachusetts state line and will pass through the towns of Hinsdale, Winchester, and Swanzey to Keene. From the latter place the route will be through Gilsum, Marlow, Lempster, Goshen, Grantham and the southwestern section of Enfield to Lebanon. Leaving the latter place, the road will go through West Lebanon, Hanover, Lyme, Orford, Piermont, Haverhill, Bath, Landaff, and Lisbon, to Littleton. In Littleton the road will run out by the Glessner place to Bethlehem Street, and from there out to the Twin Mountain House. From the last named place it will go out to Whitefield, and then over the hill to Lancaster, and from thence through Northumberland, Groveton, Stratford, and Columbia to Colebrook, where it will connect with the East Side road, running up from the coast.

It will be noted that these roads as laid out will reach a large number of the best known summer resorts of the state, alike in the beach, lake, and mountain regions. But it is true also that a large amount of new country will be opened up, where heretofore summer visitors and residents have been infrequent.

The desire shown by the legislature in many ways to foster the "summer business" of the state was consistently followed up by Governor Quinby, who, as has been said, devoted a

large amount of time, as did the members of his council, to the consideration of the highway problems presented, and who also, with members of his staff, attended several national, New England and state gatherings held at various summer resorts, and voiced the welcome of the New Hampshire commonwealth to those present.

A unique occasion graced by the presence of the governor and his staff was the open-air production in Walpole of "The Canterbury Pilgrims," by Mr. Percy Mackaye, the famous dramatist, himself a summer resident of Cornish. The presentation at Walpole was the first of several in this state, and the very large attendance and financial success of the affair were pleasing, particularly, because the net proceeds were for the benefit of the Walpole summer entertainment course, a series of high-class lectures and concerts given each season in this beautiful Connecticut valley town through the liberality and public spirit of a typical group of summer residents there.

These presentations of "The Canterbury Pilgrims" were the first of the kind in the history of the state, prior productions of the Ben Greet players having been given in halls and not *al fresco*.

Private open air masques and plays had been given, too, at Cornish, at Mr. Joseph Lindon Smith's Greek theater on his Dublin estate and elsewhere in the state.

Of another type are the jolly entertainments given, usually for the benefit of some local worthy object, by the members of the theatrical "colonies" here and there in our summer land. Notable in this line are the festivities at Lake Sunapee by the vaudeville "headliners," who are extensive property owners there and who have built a casino at Blodgett's Landing from the proceeds and for the purposes of their merrymaking.

Among provisions of the New Hampshire automobile law, as amended by the legislature of 1909, likely to be of interest to readers are the following:

"SECT. 6. Automobiles or motor cycles owned by non-

residents of this state and registered in some other state may be operated upon the roads and highways of this state, for ten days continuously, at the expiration of which time they shall be subject to registration the same as automobiles and motor cycles owned by residents of the state, subject, however, to the speed limitations contained in this act. Any non-resident person holding an operator's or chauffeur's license from another state may operate an automobile or motor cycle in this state, subject to a revocation or suspension of such right by the secretary of state for cause as hereinafter provided.

"SECT. 8. No automobile or motor cycle shall be operated upon any public highway outside the business district or the compactly built sections of a city or town at a speed greater than twenty-five miles an hour, or within the business districts or compactly built sections of a city or town at a speed greater than ten miles an hour. A point upon the road shall be considered to be within the compactly built section of a city or town if the buildings abutting upon the road for one quarter of a mile immediately adjacent to the point in question average one hundred feet apart or less. Upon traversing a crossing of intersecting ways, in going around a corner or curve which cuts off a free view of the road to be traversed, or in traversing a highway bordering a steep descent or passing over a bridge, every person operating such a vehicle shall run it at a rate of speed less than that heretofore specified, and at no time and in no place greater than is reasonable and proper, having regard to traffic, the use of the way, and the safety of the public. In traversing a crossing of intersecting ways or going around a corner or sharp curve in a road the operator shall sound his horn or bell."

One feature of the amended law that will awaken enthusiasm among automobilists is that whereby all the net proceeds of the registry department go directly to the maintenance and improvement of the highways. The registration fee is increased from \$3 to \$10.

The secretary of state on the new registration blanks calls



attention of owners of cars to that provision of the law requiring the return of number plates to the secretary of state upon the sale or other disposal of the car. Owners ought to realize that the requirement works entirely for their own protection. In any legal process an automobile is often known by its number plates, and any damage done or law violated is *prima facie* chargeable to the man in whose name the plates on the offending car stand.

The tremendous increase both in the number of automobiles owned in the state and in the number of those that reach New Hampshire each season with tourist parties, is reflected in the construction of large and modern garages in all the cities and in many of the towns and villages, situated conveniently for stopping-places on the various lines of travel.

Another result is seen in the opening of some of the old inns of the stagecoach days, whose patronage was lost with the building of the railroads, and now is restored with the coming of another means of locomotion.

What the effect of the coming airships will be remains to be seen. They are coming, surely, for the number of aeronauts descending in New Hampshire in 1909 was greater than in the previous year and will be larger yet in 1910.

Thus far there have been no ascents made from this state because of the lack of stations suitably equipped for the purpose, but it is probable that this condition will not long exist, for arrangements are making for the formation in Manchester of an Aero Club under the best of auspices.

Another act of the legislature of 1909 in which the summer residents of the state were much interested was the reorganization of the State Forestry Commission, the employment of a state forester (who already has accomplished much of value on his lines), and the making of provisions for fighting and preventing forest fires, for preserving shade and ornamental trees and for combating the insect plagues of the gypsy and brown-tail moths.

The Appalachian Mountain Club, which has done so much

for the development of the White Mountain region of New Hampshire, added to the debt which the state owes it by bringing about the preservation, in 1909, of two of the most beautiful waterfalls in New Hampshire, the celebrated Glen Ellis Falls and the Crystal Cascade in Pinkham Notch, at the foot of Mount Washington.

This has been done by the execution of leases, accepted by the trustees of real estate of the club, putting the two waterfalls and large tracts of land surrounding each into the hands of the club to be administered as public reservations. The club has now fourteen such reservations, covering some of the most choice bits of scenery in the Switzerland of America.

The two tracts recently acquired contain twenty-eight acres each. The Glen Ellis reservation borders the Pinkham Notch road from the top of Spruce Hill for nearly a quarter of a mile, and at the point opposite the falls extends for a distance of about two hundred and fifty feet on both sides of the stream. All but a small corner of this reservation is in virgin forest.

The Crystal Cascade reservation is on the opposite side of the same road, about half a mile to the north. Here, at the point where the public trail starts in for Tuckerman Ravine and the summit of Mount Washington (a trail which the club has maintained for many years), the reservation begins. It has been laid out with a uniform width of about four hundred feet, changing direction as it advances up the mountain-side to conform to the twisting of the brook.

The following list of officers of the Appalachian Mountain Club has been chosen for the ensuing year: President, William H. Pickering; vice-president, Louis F. Cutter; recording secretary, Rosewell B. Lawrence; corresponding secretary, Harry W. Tyler; treasurer, Rufus A. Bullock; councilors: natural history, Miss Harriet E. Richards; topography, Frank H. Burt; art, Mrs. Willis H. Ropes; exploration and forestry, Alexis H. French; improvements, Warren W. Hart; trustee of permanent and reserve funds (for three years), Rest F. Curtis; trustee of real estate (for four years), Harvey N. Shepard.

President Pickering is the professor of astronomy at Harvard; he is an original member of the club, and his brother, Prof. E. C. Pickering, was the first president. He is the author of "A Walking Guide to the Presidential Range," and compiled valuable articles on "Distant Points Visible from Mt. Washington." Mr. Cutler is a civil engineer and a summer resident of Randolph. He made the map of the Northern Peaks published by the club.

The club has over sixteen hundred members, and spent more than five hundred dollars last year on path work and building camps, largely in the Great Gulf, which divides Mount Washington from Jefferson, Adams, and Madison. Also it expended seven hundred and fifty dollars on its reservations, most of which are in New Hampshire and open freely to the public.

A dozen excursions into New Hampshire are managed by the club each year, some in midwinter when snowshoes are the favorite means of locomotion; some in spring, some in summer, and some in autumn. Not all of these trips are to the White Mountains, for the club has interests in other sections of the state, notably in the vicinity of Mount Monadnock, in Cheshire county. Here is located one of the most interesting of the club's bits of real estate, the famous rhododendron reservation.

The Edmands Path, constructed during the season of 1909 across the face of Mount Pleasant, is an example of the good work done for New Hampshire by those, not her native sons and daughters, but her ardent lovers.

There is no mountain path in America east of the Rockies comparable to this one. It was constructed under the personal supervision of Prof. J. Rayner Edmands and at his personal expense. It was almost possible to say that he gave his life to the work, for he was stricken with a fatal illness as a result of overexertion in surveying and laying out the line of the path through most difficult and dangerous territory and in his indefatigable efforts to push the work to completion.

He named it the Franklin Path, as it is a short cut to Mount Franklin, but all know it, as it should be known, as the Edmands Path.

The fact that the summer of 1909 was a prosperous season for the hotels of the state is proved by the extent of additions and improvements which many of them are making.

Notable in this list is Mr. Henry S. Hale's corporation in Dixville Notch, which is spending hundreds of thousands of dollars in the development of its property. A great dam has been built, which will serve, among other purposes, the creation of a beautiful lake; and this is to be followed by additions to the hotel, The Balsams, which will double its capacity.

Over at Bretton Woods the new feature of the year was the subterranean grill room, which had the honor of being formally opened by Gov. Henry B. Quincy of New Hampshire. Bretton Woods maintained its claim to being the "summer capital" of the state by entertaining the governor and his council and staff on half a dozen occasions, some of business and some of pleasure.

An interesting novelty of 1909 in the mountains was the importation from the Rockies of a dozen burros for the pleasure of the children and the patronage of older folks, who do not scorn such assistance in scaling peaks.

One of the reasons responsible for the development of summer home property in New Hampshire was illustrated during the past season by Mrs. Isabel Perkins Anderson of Brookline, Mass., and Washington, D. C., when she bought, restored and greatly improved the fine old house in the village of Contoocook, town of Hopkinton, which was once the home of her grandfather, the late Judge Perkins.

Many years ago, in the adjoining town of Webster, Mrs. Anderson's father, the late Rear Admiral George H. Perkins, whose brave services for the Union in the Civil War are commemorated by a beautiful bronze memorial on the state house grounds at Concord, bought several farms on the shores of Lake Winnipauket and created a country estate, which he thoroughly enjoyed during the last years of his life.

Here Mrs. Anderson spent much of her girlhood; here is still the favorite country home of her mother, Admiral Perkins' widow. It is not a show place, like Mrs. Anderson's magnificent Weld estate in Brookline, but it is a fine example of a real New Hampshire farm, adapted to the comfort and pleasure of its owners and vacation-time visitors, and, incidentally, managed and maintained on a sound agricultural basis.

The chief attraction of the place, perhaps, is the lake, beautiful in itself, and framing in its vistas unsurpassed views of the peak of old Kearsarge. But on shore are many beauties: the forests, thinned and trimmed on scientific principles and with a view to the effects of landscape gardening on a broad scale; the hayfields, the orchards, the gardens, the pastures, where the fine horses graze, in which Admiral Perkins took so much interest, an interest shared by his daughter.

It was this secluded spot to which Captain and Mrs. Anderson betook themselves immediately following their brilliant Boston wedding, while all the social world was wondering which fashionable resort would claim the first allegiance of their honeymoon.

Departing from a trip about the Perkins-Anderson estate, and while yet within a short distance of its borders, the writer was struck with the charm of a summer home of quite another sort.

Inquiry showed that it was the property of Miss Jessie E. Pearson, a school principal of Matteawan, N. Y., for whom Webster is the "old home" town. Returning there for a vacation visit, she found on the market and almost at the price of the proverbial "song" a little farm and farmhouse, in which she saw great possibilities. Some of them she has realized already; others she has still in view, but as it is today it is an inspiration to those seeking a rest-time home of real value at small cost.

Still another sort of New Hampshire home is that of Moses Gage Shirley, a rustic bard of the old-time sort, whose muse



is frequently and pleasantly stirred by the pictures Nature paints in his country of the Uneanoonucs.

One of these pictures he draws for us in this description of one of the numerous "Lovers' Lanes" with which New Hampshire is dotted:

Mark how the stately trees above us bend,  
 And how the sunshine glimmers through the leaves;  
 A dream of beauty everyone perceives,  
 Who walks this way with sweetheart or with friend.  
 The pines are singing low a lullaby,  
 As mothers croon their little ones to sleep,  
 Or as the waves fall lightly on the deep,  
 When the glad world in summer time doth lie.  
 This wooded road that leads us down the hill  
 Is full of memories that we cannot name;  
 Some have passed here whose feet were shod with fame,  
 And some unknown outside the place they fill;  
 But what is life, we ask, but memories still,  
 And every dreamland but some lover's lane?

Speaking of old homes, the eleventh annual celebration of Old Home Week in New Hampshire was an enjoyable event of the summer of 1909. The following call for it was issued by the state association:

With the passing of the years the hold of this festival grows stronger upon all who come within the scope of its influence, the home-dwellers in New Hampshire's heart and the home-comers to her from other states and countries.

New Hampshire never was more beautiful than she is this year. She is Nature's best loved child today, as she was when Whittier sang her beauties from the White Hills to the tented beach. The sons and daughters who come back to her will find her changed, perhaps, but for the better.

The genuine desire of her Old Home Week invitation this year is as sincere and earnest as those to which thousands have responded in the last decade. The welcome home will be as true and warm and heartfelt as ever.

Children of the Granite State, we want you all back with us for our Old Home Week this year. Whether your absence has been long or short; whether the home scenes are vivid in your memory or dim with the dust of years; come back and enjoy them once again.

N. H. OLD HOME WEEK ASSOCIATION.

FRANK W. ROLLINS, *President*.

NAHUM J. BACHELDER, *Secretary*.

The response to this call was as hearty as in the preceding years of the festival and the home-comers were numbered by the thousands. A hundred places celebrated Old Home Week or Old Home Day in one way or another, and in many instances summer residents were prominent as officers of the local association and in arranging and taking part in the various programs.

Considerable progress was made in 1909 in the industrial organization of the state through boards of trade. The State Board of Trade held several meetings, including an outing on the Uncanoonucs, and adopted some progressive policies. The White Mountain Board of Trade had the best year in its history, showing good results from work previously begun and an indicated determination to advance along similar lines in the future. One county board of trade, for Belknap county, was organized, which announced as one of its purposes the development of that section, which is in the heart of the lake country, for summer business. The number of city and town boards was increased also.

As usual, the fire record of the year contained the loss of several summer resort hotels, including the historic Pemigewasset House at Plymouth, where Nathaniel Hawthorne died and where so many thousands of visitors to the mountains had entered that region by its southern gateway. At this writing no plans have been made for its rebuilding as a hotel; but the railroad authorities have constructed a model restaurant to care for that part of the business of the old hotel.

The railroad also has concluded arrangements for rebuilding the Summit House on Mount Washington, not on its former site, but near the Lizzie Bourne monument. Practically all the other hotels lost by fire have been replaced, and, while no large new hotels were built in 1909, additions and improvements were the rule at most of them in all of the summer sections of the state.

Of interest to all those connected with the summer business of New Hampshire is the attitude of the railroads towards its development. This has been for many years and

is today extremely favorable. The alliance of the Boston & Maine and New York, New Haven & Hartford roads has resulted in the making of large appropriations for the improvement of right of way, rolling stock, and buildings in New Hampshire, and the work of spending the money is now in progress, beginning with the White Mountain Division, where new bridges and heavier rails will allow the use of more powerful locomotives and a general improvement in train service.

It is known that the management has ambitious plans for the enlarging of the vacation travel in northern New England; in fact, President Lucius Tuttle said in a public address at Boston recently that the possibilities of this travel would be bounded only by the capacity for entertainment afforded by hotels, boarding-houses, and summer homes.

#### WORK AND PLAY ON THE NEW HAMPSHIRE FARM.

Recent agitation of the high cost of living has brought to the front the cry, "Back to the farm," and it seems probable that the near future will see a spurt ahead in the demand, which has been slowly, but steadily, increasing of late, for those New Hampshire farms upon which agriculture of various sorts can be carried on with financial profit.

Sales for this purpose have resulted in growing degree from the advertising of New Hampshire's unoccupied farms by the State Board of Agriculture, even though that advertising has been directed primarily to the exposition of New Hampshire's advantages as a state of summer homes and vacation visits.

But many a farm, bought originally for a summer home, has become a source of profit to its owner, who saw in it other possibilities than those of health and pleasure, for which it was first acquired. Several of these farms have been described in past editions of "New Hampshire Farms for Summer Homes."

In the first (1902) edition the four Monadnock farms of Col. George B. Leighton were described and illustrated, with

especial reference to their reclamation to productivity, the methods of cropping adopted and their management for dairy purposes. The article was quoted from the Keene *Sentinel* newspaper, which printed it "as an object lesson to show that New Hampshire hill farms can be made productive and profitable."

In the second (1904) edition there was extended reference to and many pictures of the Blue Mountain Forest Park in Sullivan county, originally a pet project for relaxation by the late Austin Corbin, now a large corporation, which presents one of the best examples to be found anywhere of the profitable use of hill lands for scientific forestry and the marketing of lumber.

In the third (1905) edition reference was made to several women farmers, who had come to New Hampshire for their health, adopted abandoned farms and made them pecuniarily successful.

In the fourth (1906) edition a chapter was devoted to "Farms That Pay," including the Roslinwood Farm at Sugar Hill of President William M. Wood of the American Woolen Company, where are kept Holstein-Friesian cattle, large Yorkshire swine, Shropshire sheep, Angora goats, White Wyandotte and Barred Plymouth Rock poultry. Mr. Wood wrote: "No one who buys a farm with a good view, plenty of shade trees and spring water, is making a poor investment."

Recently Mr. Wood has appealed to the farmers of New England to engage in raising sheep and growing wool, pointing out the possibilities for profit therein and the necessity for such action on their part to maintain both the agricultural and manufacturing industries of New England.

Also in the 1906 book Denison R. Slade of Sandwich, son of an honored pioneer among summer residents in the New Hampshire lake region, told of the field for milk, vegetable, and berry farming in that section, with a great and growing market at the very farm doors in the form of the army of visitors to the lakes.

Brief descriptions and pictures were given of the immense "rose farm" of W. A. Elliott at Madbury; of the Shultis poultry farm at Newbury; of the extensive maple sweet production on the Sandwich farm of Henry W. Bullard of Cambridge, Mass.; and of the famous Sutton Farm of Mrs. George W. Armstrong at Center Harbor.

From this farm, in the summer of 1909, a part of its famous herd of Devon cattle was sent to the Pacific coast, where they won many ribbons and prizes at the California and Oregon state fairs and the Alaska-Yukon-Pacific Exposition at Seattle.

In the sixth edition (1908) reference was made to the large farming operations carried on by J. J. Glessner of Chicago at his estate, The Rocks, in Bethlehem, and Kona Farm at Moultonborough, owned by Herbert Dumaresq of Boston, was pictured extensively. To this same edition "A New England Teacher" contributed a chapter on "Solving the Teacher's Vacation Problem" by adopting a small abandoned farm in New Hampshire, concluding: "We look forward to the time when this farm will furnish us many of the necessities as well as luxuries of living, not only through the summer season, but through the rest of the year."

In the seventh edition (1909) Three Rivers Farm, one of the Rollins estates in Strafford county, which are farmed as a business all the year round, was shown; also Robinswood, Gilmanton, whose owner, Dr. J. M. W. Kitchen of New Jersey, is a deeply interested student and practical exponent of New Hampshire's agricultural problems. Quaint views in this volume illustrated the East Canterbury community of Shakers, where the members of a religious sect show wonderfully well how many and diversified are the industries that can be carried on successfully in connection with New Hampshire farm land and life. The Surry estate of J. N. Kellar of the New England Telephone Company is another referred to in this edition, which means more to its owner than a mere vacation tarrying place.

In this 1909 booklet the "New England teacher," who had



written in 1908 about his modest farm in the Pemigewasset valley, told of his summer home garden, saying that "the summer home garden should furnish not only a large part of the food for the summer season, but for the rest of the year as well. . . . Perhaps the greatest pleasure in owning a summer home is in thus being able from year to year to improve the conditions of living and by careful planning to make each season more enjoyable than the last."

Of another sort are the farms of the J. R. Whipple Company at New Boston, J. Reed Whipple, the head of the company, which manages Young's Hotel, the Parker House, and the Hotel Touraine in Boston, is a native of New Boston and always has spent more or less of his vacation time there.

His keen business eye saw a relationship of possible profit between the ancestral acres of the New Hampshire Whipples and the great hotels in Boston. Gradually he developed the idea until upon the twenty-five hundred acres of the Whipple farms four hundred head of cattle are kept and five hundred pounds of butter are made daily sufficient to supply the demands of the Boston hotels, which receive also all their milk and cream from the same source.

The hennery of two thousand birds supplies a portion of the poultry and table eggs for the hotels, and a piggery containing eighteen hundred porkers of various sizes furnishes the raw material from which the hams and bacons are cured and the sausages made for the hotel uses. Another product is cider, from which all the vinegar used in the hotels is made. A refrigerator car leaves New Boston every day for old Boston, loaded with these farm products.

That the Whipple farms could also supply fruit for their Boston connection, if called upon, is indicated by the story of a farm in another town of Hillsborough county, namely, Hollis. Here lives Charles E. Hardy, whose Baldwin apples won first honors at the New England fruit show in Boston, at the New Hampshire fruit show in Peterborough, and at the New York fruit show in Cornell University during the fall of 1909.

"My experience in apple growing," said Mr. Hardy, "has been with old trees.

"I took charge of the farm at Hollis about three years ago and I found the orchards sadly neglected, overgrown with bushes, and many of the trees infested with the 'San José scale.'

"I thinned the orchard, fertilized and sprayed the trees, using lime and sulphur, and also sprayed for the codling moth with a Bordeaux mixture, and soon had my trees looking bright and healthy.

"In my first year's work from my old orchard of five hundred and fifty trees I picked four hundred and fifty barrels of apples, but they were poor in quality. Most of them were scaly, and at the time I did not know with what disease they were infected.

"Later on, corresponding with the State College, through my son, I found that the apples had the 'San José scale.' I had two orchards, the north, containing two hundred trees, and the south, four hundred trees.

"That fall I harvested six hundred barrels of apples from the four hundred trees I had sprayed in the south orchard, and only one hundred barrels from the two hundred trees in the north orchard, besides one hundred and thirty-three barrels from the scattered trees.

"The apples from the south orchard, which was sprayed, were far superior to those left to care for themselves. I now saw that the secret of success lay largely in spraying. In 1907 I picked eight hundred and thirty-five barrels, of which number one hundred and eleven were scaly. In 1908 I harvested one thousand one hundred and fifty barrels, of which fifty were somewhat scaly. In 1909 I harvested one thousand barrels and only nineteen barrels were infected with the scale.

"In packing apples I pack each apple separately in paper in air-tight barrels. All barrels are stamped with my name and grade. Apple growing has been remunerative for me.

"In 1907 I received \$2,400 for my apples; in 1908, \$2,500; in 1909, \$3,500.

"In three years I have received over \$8,000 from my apple orchard and I do not know of any business that pays better or is any more interesting to conduct. In marketing apples I sell through a commission house.

"I think an apple producers' association should be formed in every apple-producing community to try and influence farmers to raise better fruit and to instruct them how to do it. My farm contains about eighty acres of tillage land and I intend to greatly increase my orchard area in the next two or three years.

"I am not wholly dependent on my orchard, either, for last season I raised twelve hundred bushels of corn, four hundred bushels of potatoes, and twenty-five tons of market hay, besides taking care of fifteen head of cattle and five horses, so you see I know something about the average work of a farmer and where the most money can be made in following the business."

The recently established industrial department of the Boston & Maine Railroad, among many other worthy endeavors, has published a booklet answering the question, "Why should I buy a farm in New Hampshire?" To this publication the secretary of the State Board of Agriculture made the following contribution:

"The advantages of New Hampshire for the branches of farming for which the soil, climate, and markets are specially adapted are unexcelled in the country, but are not appreciated by the farmers in general nor utilized as they should be.

"To be sure, New Hampshire has become a great summer resort state and is fast developing as a winter recreation resort, which brings at least \$10,000,000 a year into rural communities from outside the state, adding to the prosperity of every country town, but this great movement need not interfere with the farming interests. On the other hand, it is of great advantage to them by providing local markets at the farmers' doors for three or four months in the year at prices equal to retail prices in the Boston market."

"One tenth of this demand is not at present supplied in the line of products for the production of which the soil and climate are specially adapted and which can be produced here as profitably, considering the price for which they are sold, as may be produced hundreds of miles away, from which a large share are at present transported.

"In view of these facts I believe the most profitable opening for many farmers is in supplying this rapidly growing summer industry with farm, fruit, dairy, and poultry products, for it affords the highest prices. Next to this is catering to the demand for such products in manufacturing cities and villages by those located in the vicinity. This latter market may not afford as high prices as the former, but it lasts though the entire year. Farmers can be found in the vicinity of every manufacturing city and village in the state who have made good money and accumulated a competency in the fruit, dairy, poultry, and truck business, and yet the market has been, and is today, very inadequately supplied with fresh, nearby grown products. As already stated, the opportunity is equally as good, and even better, while it lasts, in supplying the summer trade with the same products in about every rural town in the state.

"The summer business does not interfere with the development of any line of farming for which the state is adapted. The hundreds of summer homes established, many of which are becoming all-the-year residences of their owners, are located on rugged hilltops, on mountainsides and along the shores of lakes and rivers, conditions which may be found in every section of the state and which are almost worthless for farming purposes.

"The good farming land is still available for intelligent farming. Occasionally a wealthy summer sojourner purchases a productive farm and engages in extensive and intensive agriculture, which may not be done at a profit on account of extravagant methods, but adds to the volume of farm productions and demonstrates what the soil will produce under liberal treatment.

"Great as is the summer business and great as is the income therefrom, there is no reason why such staple crops as corn, potatoes, oats, and apples cannot be produced at as great profit per acre in New Hampshire as at any former period, or in any state in the Union. Notwithstanding the idea generally prevailing to the contrary, either of the crops above named, when intelligently grown, will yield a net profit at the prices for which they can be sold here, and this is in addition to the opportunities for supplying the demands of the local markets with perishable products which are only inadequately supplied at present."

Another contributor to the same publication, Prof. F. W. Taylor of the department of agronomy at the New Hampshire College of Agriculture, Durham, quotes a Colorado man, who has settled in New Hampshire, as saying: "After looking over a good many farms in various states I came to the conclusion that I could get a better return for the capital invested here than anywhere else."

There is given the following tabular statement of the profits of three and one fourth acres of potatoes raised by Walter H. Ayer of Gilmanton:

Plowing .....	\$12.00	
Harrowing .....	10.00	
Seed .....	38.00	
Planting .....	20.00	
Cultivating .....	22.00	
Chemical fertilizers .....	120.00	
Spraying .....	7.00	
Harvesting .....	50.00	
Marketing .....	133.00	
	<hr/>	\$412.00
By 1,328 bushels potatoes at \$0.70....	\$929.60	
By 800 bushels small potatoes at .20...	16.00	
	<hr/>	945.60
Profit .....		<hr/> \$533.60



George H. Yeaton of Rollinsford, William H. Caldwell of Peterborough, and John C. McNutt of Durham tell of the opportunities for dairying in New Hampshire. The natural conditions greatly favor this industry, they say, because the farms are small and well suited to growing the crops upon which dairy cattle thrive best, while there are many clear springs, small streams and lakes to furnish a good water supply for stock.

The demand for pure, clean, wholesome milk and butter is increasing within the borders of the state every year, while thousands of cans of milk are shipped to Boston every week, and the dealers there would be glad to handle more if they could get it.

E. E. Bishop, practical poulterer of New Hampshire and Michigan, says:

"I know from personal experience the opportunities presented to the farmers of New Hampshire in the production of poultry and eggs. I have been in the business for years, and I appreciate what a lot can be done with a broken-down farm, because that was a part of my experience. I would particularly emphasize taking advantage of local conditions in every way possible, but, outside of summer hotel trade, I would establish connections with a high-grade jobbing house in a city for my main output.

"I know there are splendid chances for success on the farms of the old Granite State, but no matter whether the specialty on the farm be dairying, small fruits or garden truck, I urge the farmers not to forget a poultry yard as a side line, conducted along the right lines. I know it will pay. Try it."

Francis A. Badger of Belknap county writes of the possibilities for success with small fruits, strawberries, for instance; and with maple sugar and syrup.

There are many other opportunities for profit on the New Hampshire farm, not hitherto mentioned. If the farm has timber on it the owner can learn from the State Forestry Commission how to harvest that crop profitably and with a provident eye to the future. It may be that parts of the

farm can well be used for reforestation and the consequent benefit of the next generation.

Hay is a good crop for many a New Hampshire farmer and rarely has it sold higher than in the past season.

President Wood of the American Woolen Company begs the farmers of New Hampshire and New England to keep more sheep and shear more wool to fill the demands of the ever-increasing number of mills with which his company is dotting this section of the country.

In the past many stock farms for the breeding of horses have been maintained in New Hampshire on a large and successful scale, and today one of the country's most famous sires, Audubon Boy, 1:59 1-4, is owned in New Hampshire, where one of his colts changed hands recently at ten thousand dollars. Much interest is taken in this state in the movement to gain for the Morgan horse the favor that once was his and ought still to be his.

There are famous dog kennels in the state and pigeon lofts, which are sources of profit as well as pleasure to their owners. In short, New Hampshire soil can be profitably tilled for almost any crop, from tobacco to wheat. There is money for the intelligent purchaser and owner in its forests, its hay fields, its orchards, its gardens. Cattle, horses, sheep, swine, poultry, and pet stock have been and are being bred here with proved success.

To achieve success upon the New Hampshire farm one needs pluck and perseverance and one must work hard with both head and hands. But the same is true of every other calling, whether in city or country, and life upon the farm, with the good air and good water of the New Hampshire hills, is likely to be blessed with better health and greater happiness.

By no means all the work done upon New Hampshire farms relates to their tilling, and this is true both of the "summer folks" and of not a few of all-the-year residents.

The Phillips Brooks memorial at Trinity Church, Boston, the most discussed sculpture of recent years, was the last

work, upon his Cornish farm, of the late Augustus Saint-Gaudens. From 1884 to his death he labored there a larger percentage of his time each year, and it was there that most of his masterpieces took shape.

Other great sculptors work in New Hampshire, too: Cox and Adams, to mention no more.

Of the painters, E. C. Tarbell does the work which is now attracting so much attention at his seaside home in New-castle. Brush and Thayer at Dublin, Dewing at Chatham, the Parrishes and the Fullers and many more at Cornish and Plainfield make famous the product of studios on New Hampshire farms.

And a great deal of purely mental labor is done upon New Hampshire farm homes, in the result of which the whole world is interested. Historians like Hart and Schouler; essayists like Colonel Higginson and Doctor Crothers; novelists like Churchill; poets like Mackaye; editors like Hapgood; educators like Finley; architects like Platt; composers like Whiting; philosophers like James; all these and a hundred others of national and international fame testify that the lofty quiet of New Hampshire hills creates an atmosphere most favorable for intellectual endeavor and accomplishment..

Many as are the opportunities for profitable work upon the New Hampshire farm, they are equalled in number by the chances for enjoyable play. Both the situation of this state as to climate, affecting air, water and temperature, and its physical conformation, with mountains, hills, valleys, lakes, rivers, brooks, and seacoast, are adapted to vigorous, healthful, pleasurable life in the open.

Almost every known variety of outdoor game and sport is practiced and enjoyed in New Hampshire. Every season, spring, summer, fall, and winter, has its particular pastimes, often overlapping, of course, and it would be hard to say which of all the great number are the most popular.

The largest amount of capital, without much doubt, is invested in automobiling, counting the machines themselves,

their garages and the many incidental expenses connected with them. This sport was taken up in New Hampshire very early in its development in this country. The lake and mountain regions of this state were natural termini for tours from the large cities, and the ocean boulevard was, from its completion, utilized by thousands of motorists yearly.

The first Glidden tour or endurance run of the American Automobile Association traversed New Hampshire, as does the present Ideal Tour, given prominence in the automobile roadbooks. The rapidly increasing and already very large proportion of hotel guests who arrive in motor cars is convincing proof of the popularity of the various available routes in this state; and with the expenditure of millions of dollars upon the highway of New Hampshire this popularity will advance by leaps and bounds.

In addition to the tourists, some three thousand residents of New Hampshire own automobiles, as is shown by the returns under the registration law; and their use is very general among out-of-the-state business men with country places in the Granite State. Great credit must be given the motor cars for their part in opening up to development, beautiful, but secluded, sections of New Hampshire, off the railroad and therefore difficult of access.

In the 1907 edition of "Summer Homes" W. J. ("Senator") Morgan wrote of "Seeing New Hampshire by Automobile," as other writers told of seeing New Hampshire from steam-car windows and by trolley. Railroad travel and trolleying cannot be classed as sports, perhaps, but we are not so sure about two other methods of travel described in the same edition of this book, when the late Col. Walter M. Rogers of Boston told about seeing New Hampshire from behind his fine pair of horses, and Prof. F. S. Sutcliffe, a well-known educator, wrote about his pedestrian trips through the mountains.

The general improvement in the highways of the state benefits those who ride and drive and walk as well as those who motor, and we look to see on our New Hampshire good

roads, increasing numbers of equestrians and pedestrians, as well as of motorists. It would be well, indeed, if there could be a revival of the oldtime coaching parades, which were such beautiful features of summer life in the mountains.

It is said that there is more horseback-riding in the mountains now than used to be the case, so that the larger hotels keep fine strings of the best Kentucky saddle-horses for the use of their guests, and at Bretton Woods a riding master is regularly employed.

In a few places in the state the fine sport of pony polo is enjoyed, and some of the Massachusetts hunt clubs occasionally come over the border into New Hampshire to ride to hounds. For a number of years a New York pack was brought each summer to the Waumbek Hotel at Jefferson and a hunt club maintained in connection with the hotel and summer colony there.

The Appalachian Mountain Club, as has been said previously in this book, has done much to popularize walking tours and mountain-climbing in New Hampshire, both in winter and summer. Another efficient factor to the same end is the fact that the best of the school camps, now so numerous in New Hampshire, include in their summer curriculum several "hikes" across country, from the home camp to some famous resort or natural curiosity and back again.

In the days when the bicycle "boom" was at its height wheelmen by the hundred traveled in New Hampshire at all suitable seasons, and it does not seem impossible or even improbable that the great improvement in roads may be followed by a revival of interest in bicycling, a healthful, pleasurable and inexpensive mode of travel.

As was remarked in the first chapter of this book, ballooning is sure sport of the future in New Hampshire.

But, turning from the air and the earth to that compromise between them, the water, we find that its opportunities for travel and for sport are well improved in this state. There are several canoe clubs on the Merrimack and the Connecticut. Motor boats, too, are plenty on these and the



other rivers of the state, and it is said that Lake Winnepesaukee has more of these crafts in proportion to its size than any other body of water in this country.

Sailboats, too, are popular, though less so, perhaps, than before the motor-driven crafts make their appearance. On a dozen of the larger lakes and rivers are steamboats and steam launches. The seacoast furnishes the best of surf bathing; several of the inland cities have public baths; and a majority, probably, of the summer homes of the state are situated near enough to available bodies of water to make swimming and bathing part of their daily pleasures.

A regatta on Lake Penacook is one of the favorite forms of athletic activity at St. Paul's School, Concord, where the methods of controlling and supervising school athletics and securing the participation in them of all the boys in the school have been praised by the highest authorities.

The history of this school is of pertinent interest for reference in this publication because its foundation was made possible half a century ago by a Boston gentleman's gift of his country estate as the first home of the institution. From that small beginning has grown a plant valued at half a million dollars, with international fame for its success in fitting boys mentally, morally and physically to meet the problems of young manhood, whether in college or in business life.

The situation of the school is such that almost all forms of outdoor sport are available for the enjoyment of the boys and are made the most of by them. Golf, tennis, track and field sports and rowing are favorite amusements in the spring; football and hare and hounds in the fall and hockey in the winter.

Mention of hockey leads to the reflection that all kinds of winter sports have increased greatly in popularity of late in New Hampshire, a state which is at least as well adapted for them as any in the country.

The Appalachians, among their other good works, have

done much to introduce the splendid sport of snowshoeing, which is now widely popular. Something is done in ski running and jumping, especially at Berlin, where there is a ski club, one of whose members won the championship of the present winter at the Montreal meet.

One of the features of winter life at Little New York, in Cornish, is a toboggan slide, and others are found at various places in the state; while the old-fashioned pleasures of coasting on the crust or sliding down hill on double-runners and bob sleds are in vogue on a thousand granite hills from November to March.

Riding in a "one-horse, open sleigh" is just as much fun as when the old song was written, and "straw rides" or more ambitious excursions over the snow behind good horses are very popular. Three or four months of good skating always can be reckoned on in this latitude, and there are not a few lake and river stretches of sufficient length to make ice yachting possible.

New Hampshire was one of the first outposts to surrender when the ancient Scottish game of golf began its wonderful conquest of the country not so many years ago. Today there are many city and village golf clubs scattered through the state and every summer resort or large hotel has its own links.

Some of these courses are pronounced by experts to be of the finest quality and some notable tournaments have been held over them. There is a state golf league, which holds an annual championship tourney; a seaside league, east and west side championships in the White Mountains, etc.

Where the golf links of New Hampshire surpass those of other states is in the beauty of their location. Some of them are in the very shadow of Presidential Range; others are bathed in the salt air of the sea. Some count trout brooks and little rivers among their hazards; on others the player is halted involuntarily by the beauty of lake or valley vistas that open before him.

Before golf swept all before it lawn tennis was the favorite

game of society in many sections of New Hampshire, and to-day there are some splendid courts to be found at Newcastle, where for years an annual tournament was held that was one of the eastern fixtures of the sport; at Fitzwilliam, Dublin, Manchester, Concord, Hanover, and many other places.

The two national games of the American boy, baseball and football, flourish in New Hampshire, each in its appropriate season, and do their part towards enlivening country as well as city life.

Other sports are popular here and there. For instance, at North Woodstock bowling on the green holds high favor; at Bethlehem, croquet, in its modern and scientific form, called roque, is played by scores on grounds constructed for it with almost as much care as is used in building a billiard table.

The oldest of all sports are hunting and fishing, and for both New Hampshire has been famous ever since the first settlers replenished their scanty larders with wild turkeys and pigeons, bear and deer, trout and salmon.

For the first edition of "Summer Homes" Dr. John D. Quackenbos of New York, N. Y., and New London, N. H., wrote an appreciative chapter upon New Hampshire's fish and game, which we reprint in part, as follows:

"Fishing in New Hampshire is of the best. Nine species of Salmonidae are now native to the state.

"I. The Brook Trout, the favorite with anglers among our fresh water fauna, and endeared to all by a hundred delightful associations and reminiscences. From Quebec to the Massachusetts border the tiny brooks, the cold lakes, and the mountain streams are everywhere the home of this "gold-spangled living arrow of the white water, able to zigzag up the cataract, able to loiter in the rapids, whose dainty meat is the glancing butterfly." To wrest this sparkled coquette from the stream, resplendent in his amethystine "bloom" and cold to the feel as the icy springs he tenants, brings to the angler phenomenal satisfaction.

"II. The Lake Trout (namaycush), otherwise known as Mackinaw trout, longe, and togue, especially associated with Lakes Winnepesaukee and Newfound, where it responds in gamest mode to him who trolls with rod and multiplier.

"III. The Land-locked Salmon, known also as the Schoodic trout and the Ouananiche (signifying, in the Montagnais dialect, little salmon), the most popular of American game fishes. Specimens have been taken from Lake Sunapee weighing fourteen to twenty pounds.

"IV. The Loch Leven Trout, imported from Loch Leven, Kinross-shire, Scotland, by the author of this paper. In quickness of wit, fighting qualities, and delicacy of flavor, second to no fish in the world. Largest specimen so far taken (from Lake Sunapee), ten pounds.

"V. The Brown or Von Behr Trout of Europe, a recent importation from Caledonia Creek, New York, where it has attained a weight of eleven pounds. Grows to thirty pounds—a good-natured, slow-going, bait-loving synthesis of ocellated spots and yellow netherness and tropaeolin fins.

"VI. The Rainbow Trout, from California, so called on account of its iridescent purplish sides and broad, lateral crimson band.

"VII. The Blue-black Trout, from the Rangeley Lakes.

"VIII. The Sunapee Saibling or Aureolus, a golden-hued charr of the Alpine species, the descendant of a once widely-spread Arctic form which survives in Lake Sunapee (eight to twelve pounds). This charr is a prolific and rapidly-growing salmonoid, surpassing all congeners in symmetry and brilliancy of nuptial coloration. On the spawning beds in October the saibling wear a wedding garment that is unparagoned, circling in proud sweeps about the submerged boulders they would select as the scenes of their loves—the poetry of an epithalamion in every motion—in one direction uncovering to the sunbeams in amorous leaps their golden-tinctured sides, gemmed with the fire of rubies; in another, darting in little companies, the penciled margins of their fins seeming to trail behind them like white ribbons under the ripples. Those who have seen the bridal march of these glistening hordes, in all their glory of color and majesty of action, pronounce it a spectacle never to be forgotten.

"The graceful, silvery Dublin Pond Trout—a lover of the depths save in May and October, quick-eyed and fastidious to a fault when deftly-cast flies alight upon the rippled water—is in the opinion of the writer a variety of this form.

"IX. The Land-Locked Smelt, a delicious table-fish.

"Besides these princes of the salmon family there are in many waters of New Hampshire the black bass, of which Doctor Henshall writes: 'I consider him inch for inch and

pound for pound the gamest fish that swims; pickerel or green pike, the tyrant of a thousand lily ponds; pike perch, known also as wall-eyed pike, glass-eye, and dory—a superior food and game fish, attaining a weight of twenty-five pounds; yellow or ringed perch, with the bass, a favorite of ladies and children, who readily capture both by trolling or still fishing; silver dace, chub, or fall fish, a fly taker; the common horned pout, or bullhead; eels of delicious flavor; suckers, weighing three to four pounds, that throng the brooks in May and June and are speared by the hundred.

“The stock of game fishes is kept up by the state and national commissions. Fry are now raised to yearlings at several of the fish culture stations, and thus are capable of self-protection when planted in appropriate waters.

#### SPORT WITH THE GUN.

“Fortunate are they whose leisure permits them to linger among our hills through the dreamy Indian summer of October, and watch the flush of autumn deepen over the New Hampshire forests. The climate is then at its best. The days, if ever, are perfect. The hillsides, ablaze with crimson and gold, mirror their glories in the motionless lakes. The sun is wont to go to glade amid purple pomp or throned in pillared clouds of flame; and the rosy-lilac after-glow gives mysterious lustre to the twilight hour between sundown and moon dawn. Visitors at this glad season will find sport fair enough to keep the hammerless busy through ‘autumn’s soft, shadowy days.’ Plover, snipe, and other aquatic birds are in flock. The ruffed grouse, or drumming partridge, unsurpassed among American feathered game, abounds in every cover and may be shot after September 15. To cut this bird down in open woods as he scurries away under full sail—to walk him up with or without dogs, and stop him as he arises by some grass-grown roadside purple with asters, or in some woodland pasture where thistles scatter their down among clumps of immortelle—requires a high degree of vigilance and coolness, and implies the cream of sport.

“Throughout the fall migratory wild fowl en route to the south from arctic summer homes, dispose themselves for rest and food over the ponds, rivers and lakes. Flocks of ducks and geese frequent the larger bodies of water, and their wild chatter mingle at nightfall with ‘the loon’s weird laughter.’ The covers abound in the great northern hare; superb



woodcock shooting may be enjoyed in many localities; and the fox is always ready to match his trained instincts against the hunter's intellect and skill. Raccoons give opportunity for exciting moonlight chases. Squirrels, red and gray, are domiciled in every forest. Deer, which by reason of protection have become numerous all over the state, may be still hunted in certain counties and towns during October, November, and December.

"Winter brings its own peculiar phases of sport—none more fascinating than fox and hare coursing over the hills—no music more thrilling than the bay of hounds unkennelled of a frosty morning.



# INSPECTION OF FEEDING-STUFFS.



## INSPECTION OF FEEDING-STUFFS, 1909.

---

The inspection of commercial feeding-stuffs is becoming fully as important as the inspection of commercial fertilizers, and more difficult to execute. While the fertilizer trade is limited to about two months in the year and the number of different brands is nearly the same every year, the feeding-stuffs are being shipped into the state throughout the twelve months and new brands are appearing with almost every shipment.

This year there were found eighty-four brands duly licensed according to law, and twenty-nine brands unmentioned in the lists filed by the manufacturers and jobbers with the Secretary of the Board of Agriculture.

Our present law controlling the sale of feeding-stuffs is defective in several points as shown by experience with its workings. The most prominent defects are its provision for a license fee and its requirements regarding guarantees.

The provision for a license fee now in effect is unjust to the small manufacturer and yields too little revenue with which to conduct the inspection. All manufacturers pay a license fee, which is as large for the miller with one brand of mixed feed, as it is for the jobber who is putting forth ten brands or even more. If the money for the enforcement of the law is to be raised by license fees, there should be one for every brand, but no larger than is necessary to pay the cost of the inspection.

It has been found by experience that guarantees of protein and fat are not sufficient to insure good materials, since much cheap roughage may be mixed with a moderate amount of a concentrated by-product as cottonseed meal,



and the percentages of protein and fat will compare favorably with those for wheat bran, while the price is usually a little lower. Analysis will show a high percentage of fibre, however, which means a lower rate of digestibility than that of the standard well-known cattle-foods. For example, some of the molasses feeds have been found to contain fourteen percent of crude fibre, and though this is an improvement, because they formerly carried as much as twenty-one percent, yet they are still much in excess of the bran and even of distillers' grains. In the states, with the latest statutes governing feeding-stuffs, crude fibre is included among the constituents to be guaranteed, and a marked improvement has taken place in the character of the feeds on the market. In no other way will such materials as oat hulls and flax straw be reduced to a minimum in the various ready mixed rations.

Appreciating the defects in the present feed-stuff law, the Secretary of the State Board of Agriculture secured the introduction of a bill providing for its amendment at the last session of the legislature, which passed the House but failed report by the Senate Committee. A copy of the present feed-stuff law with the proposed amendment is to be found on pages following. We have also added a copy of a type of uniform feed-stuff law which was approved by a conference of state officials and leading manufacturers at Washington, D. C., September 10, 1909. This proposed law is very similar to that adopted by the Association of Commissioners of Agriculture of the southern states and is supported by the manufacturers so that they may have uniformity of legislation in the different states in which their goods are sold.

Of all the feeding-stuffs examined, there were few noticeable failures to meet the guarantees, and these were limited to the cottonseed meals and distillers' grains.

Of eleven different brands of cottonseed meal nine were guaranteed to contain forty-one percent of protein, but three of them should have been guaranteed in the same class with the two for which 38.5 percent was claimed.

The southern cotton crushers are particular to grade their goods according to the nitrogen content or its equivalent in protein, and prices vary accordingly; but northern grain jobbers classify all cottonseed meals alike as regards prices, and as a rule make the guarantees on the basis of choice meal.

Some offer rebates if the consumer finds the goods deficient; but the user of a few bags of cottonseed meal rarely secures an analysis, without which no rebate can be claimed. Hence a shrewd jobber can make increased profits by putting out a second-rate meal for the price of a first-rate article and maintain a reputation for square dealing by offering rebates, which can seldom be claimed. The consumer will be safe to avoid brands that inspection reports show to be inferior to the guarantees.

The attention of feeders needs to be given especially to the relation between prices and percentages of nutrients. Standard concentrated feeding-stuffs—cottonseed meal, distillers' grains, gluten feed and flax meal—ranged in price from \$1.65 to \$1.75 per one hundred pounds. There were but two of the compound feeds that sold for less than \$1.50 per one hundred pounds, while many of them cost as much as the standard concentrates.

Every feeder knows the value of cottonseed meal, gluten feed, bran, and so forth. The value of a ready mixed grain ration is uncertain, therefore there should be an effort on the part of consumers to bear the prices of such rations downward to a wider margin between them and standard materials.

The following table gives the list of brands of feeding-stuffs, together with their guarantees and the percentages found. All samples were collected by Mr. Albert J. Richardson, agent of the State Board of Agriculture, and credit is due Messrs. W. L. Adams and C. H. Reynolds for the analytical work.

Only four of the brands of cottonseed meal were duly licensed; but protein was determined in the other seven, and they are included in the table.

## COMPOSITION OF COMMERCIAL FEEDING-STUFFS, 1909.

*Cattle Foods.*

BRAND.	MANUFACTURED BY	PROTEIN.		FAT.		Cost per 100 Lbs.
		Guaranteed.	Pound.	Guaranteed.	Pound.	
COTTONSEED MEAL.						
Choice Cottonseed meal.....	American Cotton Oil Co.....	41.00	40.27	9.00	10.29	\$1.65
Battle Brand Choice Cottonseed meal.....	W. P. Battle & Co.....	41.00	40.72	8.00	.....	1.60
Cottonseed meal.....	H. E. Bridges & Co.....	41.00	40.75	7.00	.....	1.60
Owl Brand Cottonseed meal.....	F. W. Brodie Co.....	41.00	40.14	6.00	10.81	1.65
Buckeye meal.....	Buckeye Oil Co.....	39.00	38.29	7.50	.....	1.65
Old Gold Cottonseed meal.....	T. H. Bunch & Co.....	41.00	38.69	9.00	.....	1.65
Cottonseed meal.....	Cochran Oil Meal & Ginery Co.....	41.00	44.70	7.00	.....	1.70
Dixie Brand Cottonseed meal.....	Humphrey, Goodwin Co.....	41.00	38.08	7.00	10.62	1.60
Prime Cottonseed meal.....	Hunter Brothers.....	38.50	38.04	8.00	10.59	1.75
Purity Brand Cottonseed meal.....	Lackstone Smith.....	41.00	39.74	5.00	.....	1.65
Soper's Choice Cottonseed meal.....	J. E. Soper & Co.....	41.00	42.43	8.00	.....	1.65
MIXED FEEDS.						
Sucrene Dairy Feed.....	American Milling Co.....	16.50	18.35	3.50	5.65	1.50
Sucrene Horse and Mule Feed.....	".....	10.00	11.14	3.00	5.07	1.50
Biles Ubiko Horse Feed.....	J. W. Biles & Co.....	16.00	20.14	6.00	7.63	1.70
Union Grain's, Ubiko.....	".....	24.00	23.08	7.00	8.50	1.70
Buff-Ce-Co Creamery Feed.....	Buffalo Cereal Co.....	18-20.00	20.48	4-5.00	5.39	1.60
Buff-Ce-Co Horse Feed.....	".....	12.00	12.55	4.50	5.22	1.85
Buff-Ce-Co Chop Feed.....	".....	7- 8.00	7.99	3-4.00	4.79	1.40
Pearl Horse and Cow Feed.....	Chapin & Co.....	6-10.00	9.48	3-6.00	4.81	1.50
Unicorn Balanced Dairy Ration.....	".....	26.00	28.58	6.00	6.06	1.65
Wirthmore Stock Feed.....	Charles M. Cox Co.....	10-12.00	10.18	4-5.00	9.56	1.65
Boss Chop Feed.....	".....	8.50	9.83	3.50	5.04	1.75
Daisy Dairy Feed.....	Great Western Cereal Co.....	14-16.00	17.74	3-4.00	5.05	1.50

Sterling Stock Feed.....	11.13.50	11.58	4.5 50	4.32	\$1.60
Laskell Stock Food.....	8.10.00	10.27	4.50	9.22	1.65
Algrane Horse Feed.....	12.00	12.64	4.50	5.69	1.85
Algrane Milk Feed.....	14.00	18.65	4.00	4.50	1.55
New England Stock Food.....	9.00	9.30	4.00	8.25	1.55
Husted Germinola.....	9.11.00	7.77	3.5 00	5.77	1.60
Molasses Feed.....	18.20.00	19.53	4.00	4.03	1.50
Jersey Mixed Feed.....	10.12.00	12.38	2.5 3.50	3.43	1.35
Sugarloaf.....	18.00	19.53	4.50	8.19	1.50
Schumacher Stock Feed.....	10.00	12.55	4.00	4.18	1.65
Victor Feed.....	7.50	9.21	3.00	3.62	1.60
Paragon Dairy Feed.....	28.30.00	30.76	5.7 00	6.89	1.60
Cleveland Flax Meal.....	36.00	38.74	1.00	4.75	1.75
Old Process Oil Meal.....	32.00	34.75	5.00	6.05	2.00
Cream of Corn Gluten Feed.....	23.00	26.33	2.50	3.30	1.70
Clinton Gluten Feed.....	23.00	23.08	3.00	5.80	1.70
Pekin Crescent Gluten Feed.....	23.00	28.26	2.55	2.57	1.65
Ajax Flakes.....	31.00	29.31	12.00	12.40	1.75
J. W. Biles Co., XX Grains.....	30.00	27.43	8.00	12.62	1.65
Biles XXXX Grains.....	33.00	31.59	11.00	11.94	1.75
Empire State Dairy Feed.....	32.00	26.24	11.00	12.42	1.65
Wirthmore Hominy Feed.....	10.50	10.79	7.50	11.62	1.60
Star Feed.....	7.00	8.65	6.50	6.83	1.40
Star Cotton Feed.....	10.00	12.07	7.50	7.84	1.60
Blatchford Calf meal.....	25.00	28.39	5.00	5.13	3.30
Triangle Calf Food.....	.....	21.77	.....	10.22	2.25
Gregon Calf meal.....	25.00	21.72	5.00	8.87	3.00
Schumacher Calf meal.....	19.00	20.75	8.00	9.45	3.00
CHICKEN FEEDS.					
Buff-Ce-Co Chick Feed.....	.....	12.16	.....	4.74	2.25
Buff-Ce-Co Poultry Feed.....	17.00	14.39	5.00	6.39	2.10
Wirthmore Grainless Chick Feed.....	.....	10.49	.....	3.08	2.00
Wirthmore Poultry Mash.....	20.00	21.06	3.00	3.12	2.00
Cyphers Chick Feed.....	10.24	11.41	3.40	3.18	2.00
Sterling Scratch Feed.....	11.00	10.23	3.00	4.50	2.00
Monadnock Scratch Feed.....	11.00	11.14	3.60	3.94	1.75
Algrane Scratching Feed.....	11.00	11.67	3.50	3.94	1.75
Chick Feed.....	12.00	12.20	3.00	4.33	2.10
H-O Co.'s Poultry Feed.....	17.00	18.34	5.50	5.76	2.00
Chick Feed.....	12.00	12.46	4.00	3.96	2.25
Laying Mash.....	15.00	15.71	3.00	6.27	2.10
Scratch Feed.....	.....	11.15	.....	4.56	2.10
Great Western Cereal Co.....	11.13.50	11.58	4.5 50	4.32	\$1.60
W. H. Haskell & Co.....	8.10.00	10.27	4.50	9.22	1.65
H-O Co.....	12.00	12.64	4.50	5.69	1.85
"	14.00	18.65	4.00	4.50	1.55
"	9.00	9.30	4.00	8.25	1.55
Husted Milling Co.....	9.11.00	7.77	3.5 00	5.77	1.60
"	18.20.00	19.53	4.00	4.03	1.50
Indiana Milling Co.....	10.12.00	12.38	2.5 3.50	3.43	1.35
Northwest Mills Co.....	18.00	19.53	4.50	8.19	1.50
Quaker Oats Co.....	10.00	12.55	4.00	4.18	1.65
"	7.50	9.21	3.00	3.62	1.60
St. Albans Grain Co.....	28.30.00	30.76	5.7 00	6.89	1.60
"	36.00	38.74	1.00	4.75	1.75
American Linseed Co.....	32.00	34.75	5.00	6.05	2.00
"	23.00	26.33	2.50	3.30	1.70
American Maize Products Co.....	23.00	23.08	3.00	5.80	1.70
Clinton Sugar Refining Co.....	23.00	28.26	2.55	2.57	1.65
Corn Products Refining Co.....	31.00	29.31	12.00	12.40	1.75
Ajax Milling and Feed Co.....	30.00	27.43	8.00	12.62	1.65
"	33.00	31.59	11.00	11.94	1.75
J. D. Page & Co.....	32.00	26.24	11.00	12.42	1.65
Charles M. Cox Co.....	10.50	10.79	7.50	11.62	1.60
Toledo Elevator Co.....	7.00	8.65	6.50	6.83	1.40
"	10.00	12.07	7.50	7.84	1.60
J. W. Barwell.....	25.00	28.39	5.00	5.13	3.30
Chapin & Co.....	.....	21.77	.....	10.22	2.25
Great Western Cereal Co.....	25.00	21.72	5.00	8.87	3.00
Quaker Oats Co.....	19.00	20.75	8.00	9.45	3.00
Buffalo Cereal Co.....	.....	12.16	.....	4.74	2.25
"	17.00	14.39	5.00	6.39	2.10
Charles M. Cox Co.....	.....	10.49	.....	3.08	2.00
"	20.00	21.06	3.00	3.12	2.00
Cyphers Incubator Co.....	10.24	11.41	3.40	3.18	2.00
Great Western Cereal Co.....	11.00	10.23	3.00	4.50	2.00
Holbrook Grocery Co.....	11.00	11.14	3.60	3.94	1.75
H-O Co.....	11.00	11.67	3.50	3.94	1.75
"	12.00	12.20	3.00	4.33	2.10
"	17.00	18.34	5.50	5.76	2.00
Husted Milling Co.....	12.00	12.46	4.00	3.96	2.25
"	15.00	15.71	3.00	6.27	2.10
"	.....	11.15	.....	4.56	2.10

## COMPOSITION OF COMMERCIAL FEEDING-STUFFS.—Continued.

BRAND.	MANUFACTURED BY	PROTEIN.		FAT.		Cost per 100 Lbs.
		Guaranteed.	Found.	Guaranteed.	Found.	
CHICKEN FEEDS.—Continued.						
Intermediate Chick Feed.....	Park & Pollard Co.....	20.00	10.71	3.00	3.44	\$2.50
Growing Feed.....	".....	14.00	13.42	3.00	3.19	2.50
Dry Mash Feed.....	".....	20.00	22.63	3.00	4.00	2.50
Screened Scratch Feed.....	".....	10.00	11.23	3.00	4.70	2.50
American Poultry Feed.....	Quaker Oats Co.....	12.00	13.16	3.00	7.72	1.90
Schumacher Scratching Grains.....	".....	10.50	10.36	3.00	3.47	2.00
Schumacher Chick Feed.....	".....	10.00	10.71	3.50	3.50	2.50
Purina Mill Feed, Chick Size.....	Ralston Purina Co.....	11.00	11.41	3.60	4.36	2.15
Worcester Chick Grower.....	Ross Bros.....	12.00	12.02	2.12	3.80	2.25
Wyandotte Chicken Food.....	".....	8.25	9.39	3.25	3.13	2.25
Gritless Chick Feed.....	St. Albans Grain Co.....	11.00	11.41	1.00	3.04	.....
Bradley's Superior Meat Meal.....	Am. Agr. Chemical Company.....	.....	31.42	.....	12.97	4.15
Ground Beef Scraps.....	".....	40.00	47.61	5.00	9.34	2.50
Star Granulated Bone.....	Beach Soap Co.....	25.00	25.93	5.00	12.45	2.25
Star Brand Bone Meal.....	".....	10.00	12.94	8.00	12.50	1.85
Star Cracked Bone.....	".....	25.00	25.11	5.00	7.08	2.50
Star Brand Meat and Bone.....	".....	30.00	32.91	10.00	9.88	1.85
Star Brand Pure Ground Beef Scraps.....	".....	.....	40.67	.....	21.00	2.75
Bowker's Animal Meal.....	Bowker Fertilizer Co.....	40.00	39.79	5.00	12.36	2.50
Beef Scraps.....	".....	40.00	47.95	5.00	15.21	2.50
Dow's Ground Beef Scraps.....	John C. Dow Co.....	43.00	42.92	12.00	13.93	2.50
Beef Scraps.....	Hinckley Rendering Co.....	35.00	38.72	10.00	14.62	2.75
Bone and Meat Meal.....	".....	35.00	35.98	5.00	9.25	2.50
Page's Perfected Poultry Food.....	C. S. Page.....	24.00	25.27	8.00	13.66	3.00
Swift's Lowell Beef Scraps.....	".....	35.00	45.45	10.00	15.10	2.60
Meat and Bone Meal.....	Swift's Lowell Fertilizer Co.....	40.00	45.85	8.00	11.44	2.50
Pure Beef Scraps.....	Whitman & Pratt.....	40.00	42.07	10.00	16.44	2.40



A notable feature of the inspection this year is the marked increase in the number of brands of poultry foods, especially of the grain mixtures. A study of prices is interesting, since it shows they cost from \$2 to \$2.50 per one hundred pounds. Of the grains, wheat, oats, barley, corn, and so forth, wheat was the only one which sold as high as \$2 per one hundred pounds at retail. It is asserted over and over again, that the farmer must grade his products or else be satisfied with the price of the poorest article for the lot.

In the feed business, it seems that the farmer is paying the price of the best ingredient for the whole mixture.

## THE PRESENT FEED LAW.

### STATE OF NEW HAMPSHIRE.

#### CHAPTER 35, SESSION LAWS OF 1901.

#### An Act to Regulate the Sale of Concentrated Commercial Feeding-Stuffs.

SECTION 1. Every manufacturer, company, or person who shall sell, offer, or expose for sale or for distribution in this state any concentrated commercial feeding-stuff used for feeding farm live-stock, shall furnish with each car or other amount shipped in bulk and shall affix to every package of such feeding-stuff, in a conspicuous place on the outside thereof, a plainly printed statement clearly and truly certifying the number of net pounds in the package sold or offered for sale, the name or trade-mark under which the article is sold, the name of the manufacturer or shipper, the place of manufacture, the place of business, and a chemical analysis stating the percentages it contains of crude protein, allowing one per centum of nitrogen to equal six and one fourth per centum of protein, and of crude fat, both constituents to be determined by the methods prescribed by the association of official agricultural chemists. Whenever any feeding-stuff is sold at retail in bulk or in packages belonging to the purchaser, the agent or dealer,

upon request of the purchaser, shall furnish to him the certified statement named in this section.

SECT. 2. The term "concentrated commercial feeding-stuffs," as used in this act, shall include linseed meals, cottonseed meals, pea meals, cocoanut meals, gluten meals, gluten feeds, maize feeds, starch feeds, sugar feeds, dried brewer's grains, malt sprouts, hominy feeds, cerealine feeds, rice meals, oat feeds, corn and oat chops, ground beef or fish scraps, mixed feeds, and all other materials of similar nature; but shall not include hays and straws, the whole seeds nor the unmixed meals made directly from the entire grains of wheat, rye, barley, oats, Indian corn, buckwheat and broom corn; neither shall it include wheat, rye, and buckwheat brans or middlings, not mixed with other substances, but sold separately, as distinct articles of commerce, nor pure grains ground together.

SECT. 3. Before any manufacturer, company, or person shall sell, offer, or expose for sale in this state any concentrated commercial feeding-stuffs, he or they shall, for each and every feeding-stuff bearing a distinguishing name or trade-mark, file annually during the month of December with the secretary of the board of agriculture a certified copy of the statement specified in the preceding section, said certified copy to be accompanied, when the secretary shall so request, by a sealed glass jar or bottle containing at least one pound of the feeding-stuff to be sold or offered for sale, and the company or person furnishing said sample shall thereupon make affidavit that said sample corresponds within reasonable limits to the feeding-stuff which it represents, in the percentage of protein and fat which it contains.

SECT. 4. Each manufacturer, importer, agent, or seller of any concentrated commercial feeding-stuffs, shall pay annually during the month of December to the secretary of the Board of Agriculture a license fee of twenty dollars. Whenever a manufacturer, importer, agent or seller of concentrated commercial feeding-stuffs desires at any time to sell such material and has not paid the license fee there-

for in the preceding month of December, as required by this section, he shall pay the license fee prescribed herein before making any such sale. The amount of license fees received by said secretary pursuant to the provisions of this section shall be paid by him to the treasurer of the state of New Hampshire. The treasurer of the state of New Hampshire shall pay from such amount when duly approved the moneys required for the expense incurred in making the inspection required by this act and enforcing the provisions thereof. The secretary of the Board of Agriculture shall report biennially to the legislature the amount received pursuant to this act, and the expense incurred for salaries, laboratory expenses, chemical supplies, traveling expenses, printing, and other necessary matters. Whenever the manufacturer, importer or shipper of concentrated commercial feeding-stuff shall have filed the statement required by section 1 of this act and paid the license fee as prescribed in this section, no agent or seller of such manufacturer, importer or shipper shall be required to file such statement or pay such fee.

SECT. 5. The secretary of the Board of Agriculture shall annually cause to be analyzed at the New Hampshire College Agricultural Experiment Station, at least one sample, to be taken in the manner hereinafter prescribed, of every concentrated commercial feeding-stuff sold or offered for sale under the provisions of this act. Said secretary shall cause a sample to be taken, not exceeding two pounds in weight, for said analysis, from any lot or package of such commercial feeding-stuff which may be in the possession of any manufacturer, importer, agent or dealer in this state; but said sample shall be drawn in the presence of the parties in interest, or their representatives, and taken from a parcel or a number of packages, which shall not be less than ten per centum of the whole lot sampled, and shall be thoroughly mixed, and then divided into two equal samples, and placed in glass vessels and carefully sealed and a label placed on each stating the name of the party from whose

stock the sample was drawn and the time and place of drawing, and said label shall also be signed by the person taking the sample, and by the party or parties in interest or their representatives at the drawing and sealing of said samples; one of said duplicate samples shall be retained by the secretary and the other by the party whose stock was sampled, and the sample or samples retained by the secretary shall be for comparison with the certified statement named in section 3 of this act. The result of the analysis of the sample or samples so procured, together with such additional information as circumstances advise, shall be published in reports or bulletins from time to time.

SECT. 6. Any manufacturer, importer or person who shall sell, offer or expose for sale or for distribution in this state any concentrated commercial feeding-stuff, without complying with the requirements of this act, or any feeding-stuff which contains substantially a smaller percentage of the constituents than are certified to be contained, shall, on conviction in a court of competent jurisdiction, be fined not more than one hundred dollars for the first offense, and not more than two hundred dollars for each subsequent offense.

SECT. 7. Any person who shall adulterate any kind of meal or ground grain with milling or manufacturing offals, or any other substance whatever, for the purpose of sale, unless the true composition, mixture, or adulteration thereof is plainly marked or indicated upon the package containing the same or in which it is offered for sale; or any person who knowingly sells, or offers for sale, any meal or ground grain which has been so adulterated unless the true composition, mixture, or adulteration is plainly marked or indicated upon the package containing the same, or in which it is offered for sale, shall be fined not less than twenty-five or more than one hundred dollars for each offense.

SECT. 8. Whenever said secretary becomes cognizant of the violation of any of the provision of this act he shall prosecute the party or parties thus reported; but it shall be

the duty of said secretary, upon thus ascertaining any violation of this act, to forthwith notify the manufacturer, importer or dealer in writing, and give him not less than thirty days thereafter in which to comply with the requirements of this article; but there shall be no prosecution in relation to the quality of any concentrated commercial feeding-stuff if the same shall be found substantially equivalent to the certified statement named in section 3 of this article.

SECT. 9. This act shall take effect December first, nineteen hundred and one.

## PROPOSED AMENDMENT TO THE FEED LAW.

### STATE OF NEW HAMPSHIRE.

IN THE YEAR OF OUR LORD ONE THOUSAND NINE HUNDRED  
AND NINE.

An Act to Amend Chapter 35, Session Laws of 1901, entitled An Act to Regulate the Sale of Concentrated Commercial Feeding-Stuffs.

SECTION 1. That section 1 of chapter 35, Session Laws of 1901, be amended by inserting after the words "and of crude fat," the words "and of crude fibre," so that the section as amended shall read: Every manufacturer, company or person, who shall sell, offer or expose for sale or for distribution in this state any concentrated commercial feeding-stuff used for feeding farm live-stock, shall furnish with each car or other amount shipped in bulk and shall affix to every package of such feeding-stuff, in a conspicuous place on the outside thereof, a plainly printed statement clearly and truly certifying the number of net pounds in the package sold or offered for sale, the name or trademark under which the article is sold, the name of the manufacturer or shipper, the place of manufacture, the place of business, and a chemical analysis stating the percentages it contains of crude protein, allowing one per centum of nitrogen to equal six and one-fourth per centum of protein,



of crude fat and of crude fibre, both constituents to be determined by the methods prescribed by the association of official agricultural chemists. Whenever any feeding-stuff is sold at retail in bulk or in packages belonging to the purchaser, the agent or dealer, upon request of the purchaser, shall furnish to him the certified statement named in this section.

SECT. 2. That section 2 of the same act be amended by inserting after the words "corn and oat chops," the words "wheat, rye, and buckwheat bran and middlings," and by striking out the words "neither shall it include wheat, rye, and buckwheat brans or middlings, not mixed with other substances, but sold separately, as distinct articles of commerce, nor pure grains ground together," so that section 2 shall read: The term "concentrated commercial feeding stuffs," as used in this act, shall include linseed meals, cottonseed meals, pea meals, cocoanut meals, gluten meals, gluten feeds, maize feeds, starch feeds, sugar feeds, dried brewer's grains, malt sprouts, hominy feeds, cerealine feeds, rice meals, oat feeds, corn and oat chops, wheat, rye, and buckwheat bran and middlings, ground beef or fish scraps, mixed feeds, and all other materials of similar nature; but shall not include hays and straws, the whole seeds nor the unmixed meals made directly from the entire grains of wheat, rye, barley, oats, Indian corn, buckwheat and broom corn.

SECT. 3. That section 4 of said act be amended by substituting for the words "a license" the words "an analysis" throughout the section; by substituting the word "fifteen" for the word "twenty"; and by inserting after the word "dollars" the words "for each brand offered for sale within the state," so that section 4 as amended shall read: Each manufacturer, importer, agent or seller of any concentrated commercial feeding-stuffs, shall pay annually during the month of December to the secretary of the Board of Agriculture an analysis fee of fifteen dollars, for each brand offered for sale within the state. Whenever a manu-

facturer, importer, agent or seller of concentrated commercial feeding-stuffs desires at any time to sell such material and has not paid the analysis fee therefor in the preceding month of December, as required by this section, he shall pay the analysis fee prescribed herein before making any such sale. The amount of analysis fees received by said secretary pursuant to the provisions of this section shall be paid by him to the treasurer of the state of New Hampshire. The treasurer of the state of New Hampshire shall pay from such amount when duly approved the moneys required for the expense incurred in making the inspection required by this act and enforcing the provisions thereof. The secretary of the Board of Agriculture shall report biennially to the legislature the amount received pursuant to this act, and the expense incurred for salaries, laboratory expenses, chemical supplies, traveling expenses, printing, and other necessary matters. Whenever the manufacturer, importer or shipper of concentrated commercial feeding-stuff shall have filed the statement required by section 1 of this act and paid the analysis fee as prescribed in this section, no agent or seller of such manufacturer, importer or shipper shall be required to file such statement or pay such fee.

#### UNIFORM FEEDSTUFF LAW.

Approved by a Conference of State Officials and Manufacturers at Washington, D. C., September 10, 1910.

A conference of feed-stuff manufacturers and state officials, having in charge the enforcement of cattle-feed laws, was held at Washington, D. C., September 10, 1909, for the purpose of recommending a type of legislation which would bring about a greater uniformity in the feed-stuff laws of the several states. This conference appointed a committee to report to them such a type of legislation, which committee consisted as follows:

State officials: Dr. E. B. Voorhees, Director New Jersey Agricultural Experiment Station, chairman; Dr. E. H.

Webster, Director Kansas Agricultural Experiment Station; Dr. E. H. Jenkins, Director Connecticut Agricultural Experiment Station; Dr. B. W. Kilgore, State Chemist, North Carolina; Mr. N. B. Critchfield, Secretary of Agriculture of Pennsylvania; Mr. L. F. Brown, Chief Bureau of Food Stuffs, New York Department of Agriculture.

Manufacturers: Mr. J. C. Reid, Corno Mills Co., St. Louis, Mo.; Mr. G. A. Chapman, Quaker Oats Co., Chicago; Mr. J. W. Young, Great Western Cereal Co., Chicago; Mr. A. S. Winter, American Milling Co., Chicago; Mr. W. R. Anderson, of "Flour and Feed," Milwaukee, Wis., Mr. M. C. Peters (by proxy), M. C. Peters Mill Co., Omaha, Neb.

Dr. Voorhees reported for this committee as follows:

The following is rather a declaration of our views than what is meant to apply in any one state, so what I read is not complete in the sense that it is supposed to cover all conditions that may arise in different states.

#### WHAT THE LAW SHOULD CONSIST OF.

The report of the committee is as follows:

SECTION 1. It is recommended that section 1 shall define clearly the commercial feeding-stuffs which are intended to be covered by the provisions of the act, and so far as possible all feeding-stuffs shall be included which are intended for use for domestic animals except hays and straws, the unmixed grains or whole seeds and the unmixed meals or chops made directly of the entire grains or seeds of the cereals and buckwheat.

SECT. 2. This section shall require that whoever sells, offers or exposes for sale any commercial feeding-stuff covered by the provisions of section 1, shall cause to be plainly printed on each package or on a tag affixed to each package a statement which shall give the following information:

No. 1. The number of net pounds in the package.

No. 2. The name, brand or trade-mark.

- No. 3. The name and principal address of the manufacturer or person responsible for placing the commodity on the market.
- No. 4. Its chemical analysis expressed in the following terms:
- (a) The minimum per centum of crude protein.
  - (b) The minimum per centum of crude fat.
  - (c) The maximum per centum of crude fibre.
- No. 5. If a compounded or mixed feed the specific name of each ingredient contained therein.

If any such commercial feeding-stuffs shall be sold, exposed or offered for sale in bulk such printed statement shall accompany each car or lot. Whenever any feeding-stuff is sold at retail in bulk, or in any package belonging to the purchaser, the agent or dealer upon request of the purchaser, shall furnish to him the certified statement named in this section.

SECT. 3. Before any manufacturer, firm, association, corporation or person shall sell, offer or expose for sale in this state any commercial feeding-stuff, he or they shall have for each and every brand of such feeding-stuff filed with the proper official, a certified copy of the statement specified in section 2, said certified copy to be accompanied, when the officer in charge shall so request, by a sealed package containing at least one pound of the feeding-stuff to be offered or exposed for sale, and the company or person furnishing said sample shall thereupon make affidavit that said sample corresponds to the feeding-stuff which it represents, in the per centum of crude protein, crude fat, and crude fibre, and if a compounded or mixed feed, the specific name of each ingredient contained therein.

SECT. 4. The proper official shall cause to be analyzed at least once in each year at least one sample of the different commercial feeding-stuffs sold or offered for sale under the provisions of this act. The said proper official, or his duly authorized representative shall take a fair representative sample in the presence of at least one witness.

This sample must be divided, in the presence of such witness, into two equal parts, each part weighing not less than one half pound; such parts shall be put in sealed packages in the presence of said witness, one package to be delivered to the person apparently in charge of the sale of such feed, the other sample the proper official shall cause to be analyzed at the earliest possible opportunity and the result of the analysis of the sample or samples so procured, together with such additional information as the proper official may deem advisable, shall immediately be transmitted to the manufacturer or person responsible for placing the feed on the market, and shall be published in reports or bulletins from time to time.

SECT. 5. No manufacturer, importer or seller shall sell, offer or expose for sale in this state, any commercial feeding-stuff that is poisonous or deleterious to domestic animals.

SECT. 6. Any manufacturer, importer or seller who violates any of the provisions of this act, shall upon trial and conviction, be guilty of a misdemeanor which shall be punished by a fine of not less than \$. . . . nor more than \$. . . . for each such offense.

Mr. Brown moved the adoption of the report. The motion was seconded by Dr. Webster, and unanimously adopted by the conference.

At this point Dr. E. H. Jenkins, Director of the Agricultural Experiment Station of Connecticut, presented the following as a preamble for the outline of a uniform feed law reported by the committee, and moved that it be made a part of the memorandum of the doings of the conference.

A conference was called in Washington, D. C., on September 9, 1909, by the American Feed Manufacturers' Association to which were invited the officials charged with the inspection of commercial feedstuffs in all the states of the Union, having laws on the subject.

Such officials, or their representatives, were present from the following states: Massachusetts, Rhode Island, Connec-



ticut, New Jersey, Pennsylvania, Maryland, Virginia, Kentucky, Kansas, North Carolina, New York.

A preliminary draft of the subjoined statement was prepared by a joint committee of the association and the feed control officials, and after full discussion was adopted by the conference.

It expresses the general opinion of this conference as to the main features of a law regulating the sale of commercial feeding-stuffs in the states, which if it were made the basis of all state laws on the subject would adequately protect both buyer and seller, and, by securing uniformity of requirements as to branding or tagging, would avoid much of the embarrassment and confusion now experienced by manufacturers and dealers which results from the differences and multiplicity in the requirements of the present laws on the subject.

The conference recognizes the fact that certain provisions of state laws, such as particular exemptions from its provisions, the taxation of sales by license fees, tonnage tax, etc., cannot be made alike in all the states, but believes that the most important features of a uniform law are embodied in this memorandum, and urges that such uniformity as to statements of composition and guarantees as herein suggested should be secured in the state laws.

The statement bears the official endorsement of one large section of the feed trade but is accepted by the state officials present only in their individual capacity and not in any sense as officially representing any organization.

## AVERAGE COMPOSITION OF COMMON CATTLE FOODS.

	Water.	Ash.	Protein.	Soluble Carbohydrates.	Fibre.	Fat.
* Hay, redtop .....	8.9	5.2	7.9	47.4	26.6	1.9
* Hay, timothy .....	13.2	4.4	5.9	45.0	29.0	2.5
* Hay, clover .....	15.3	6.2	12.3	38.1	24.8	3.3
* Hay, Hungarian .....	7.7	6.0	7.5	49.0	27.7	2.1
* Oat fodder .....	8.9	6.2	7.6	45.1	29.3	2.8
* Rye fodder, in bloom...	8.5	5.9	9.7	43.4	30.2	2.3
* Corn stover .....	40.1	3.4	3.8	31.9	19.7	1.1
† Corn silage .....	80.5	1.5	1.6	10.0	5.8	0.6
* Corn, N. H. Flint.....	10.1	1.5	11.6	70.2	1.1	5.5
* Corn, Western Dent.....	10.6	1.5	10.3	70.4	2.2	5.0
* Corn meal .....	15.0	1.4	9.2	68.7	1.9	3.8
¶ Hominy feed .....	9.0	2.8	11.0	65.0	3.6	8.6
* Oats, whole .....	11.0	3.0	11.8	59.7	9.5	5.0
¶ Corn and oats, pure.....	12.0	2.2	9.8	68.5	3.3	4.2
§ Wheat bran, spring.....	10.6	6.0	16.3	53.0	9.4	4.7
§ Wheat bran, winter.....	11.7	5.9	15.2	54.8	8.5	3.9
¶ Wheat middlings, white..	11.3	2.7	15.8	62.5	3.5	4.2
¶ Wheat middlings, brown..	10.6	3.8	17.8	57.0	5.5	5.3
¶ Wheat feed .....	10.8	4.3	17.0	58.1	5.1	4.7
¶ Gluten feed .....	8.6	1.2	26.3	53.4	6.9	3.6
¶ Gluten meal .....	8.8	0.7	35.5	50.3	1.6	3.1
‡ Distillers' grains .....	8.8	1.8	32.1	24.9	11.0	11.4
‡ Brewers' grains .....	8.0	3.8	23.1	49.4	10.8	4.9
‡ Malt sprouts .....	11.0	5.8	27.1	42.6	11.9	1.6
¶ Linseed meal, old process..	9.8	5.5	33.9	35.7	7.3	7.8
¶ Linseed meal, new process	9.1	5.8	35.2	38.4	8.5	3.0
¶ Cottonseed meal .....	6.9	7.2	44.6	25.1	5.6	10.6

\* Composition of American Feeding Stuffs. Jenkins and Winton.

† Analyses made at the N. H. Expt. Sta., 1895-1899.

‡ Hatch Expt. Sta. Bull., No. 94.

§ Penn. Expt. Sta. Bull., No. 48.

¶ Compiled from Feed Inspection Reports of various states.

## INSPECTION OF FEEDING-STUFFS, 1910.

---

Each year, as has been pointed out heretofore in these reports, the inspection of commercial feeding-stuffs is becoming more important. There has been a steady increase for a number of years in the number of brands of feeds inspected by the State Board of Agriculture. This year there were one hundred and thirty-five brands of feed offered for sale in New Hampshire from which official inspection samples were taken.

It has been pointed out before in these columns that our present feed laws are not adequate to meet the present needs of both the producer or jobber and the consumer. The inadequacy of our present laws are intensified at present by the fact that the laws in all of the neighboring states are more rigid and effective. For instance, when a carload of cottonseed meal goes into the state of Maine, no part of it can be offered for sale until it has been properly inspected. It is not, therefore, an easy proposition to sell 37 percent cottonseed meal for 41 percent in the state of Maine. In New Hampshire the present methods of inspection do not enable the consumer to know about his feed until several months after it has been paid for and when rebates are not to be obtained. The consumers of commercial feed-stuffs should rise up and demand better laws and a strict enforcement of the same. Feed jobbers evidently are thoroughly conversant with the New Hampshire methods of inspection. This is shown by comparing the last report of the New Jersey station with the results herein reported. New Jersey reports 340 brands of feeds, 8.5 percent of which had deficiencies in protein or fats. In New Hampshire 32 percent of the brands were deficient in protein alone. About 28 percent

were deficient in fat. Seventeen samples were deficient in both fat and protein. Whether this represents carelessness on the part of the sellers or whether New Hampshire is to become or has become the dumping-ground for inferior feed-stuffs remains to be seen. At any rate it is perfectly logical to expect to find inferior products offered for sale unless some changes are made in the present methods. It is very doubtful if alone the publicity given to poor articles will longer answer the public needs.

Twelve brands of cottonseed meal have been sampled and analyzed. Fifty percent of these did not satisfy the guarantee with respect to protein. In one case the deficiency amounted to eighteen percent, while in two others the deficiencies were a little more than thirteen percent. These represent pretty fair margins for profit and loss. On the other hand, one sample showed a protein content of more than seven percent greater than the guarantee. Two dollars per ton represented the difference in the selling price of the poorest and best meals. This is a matter which both the consumer and seller might well think about. It is obvious that something should be done that would give the consumer an opportunity to know what he buys. A revision of the present law together with some changes in the analytical facilities would meet these needs. The dealer in high grade feeding-stuffs should be as insistent as the consumer for these changes. The results would be his best advertisements.

The growth of the poultry business has been accompanied by a great flood of poultry feeds. These are compounded from many grains and seeds, charcoal, mealscraps, bone shells, etc. Without discussing the merits of the different brands of these feeds a few general remarks may be in order. Some of these feeds are made from a good quality of grains. Others are a mixture of screenings and inferior grains. A careful inspection of these mixtures will usually enable one to determine something about the quality. Usually the price is sufficient to cover the cost of a high-grade arti-

ele. The prices of the best mixtures are little different from the prices of the inferior mixtures.

The beef scraps and animal meals while numerous, do not call for any particular comment. Because of the general nature of the materials which go into these, the composition is necessarily more or less variable. In general all of these meal mixtures are by-products of packing house industries and have become important as poultry feeds. Because of the general composition of these products, proper sampling is difficult at best and small deviations from the guarantee are not particularly significant.

Among the feeds one sample of alfalfa meal has been reported. The price at which his feed was offered for sale together with its composition furnishes data for the feeder to think about. The average composition of good dry clover hay is twelve percent protein and three percent fat. It is very obvious from these data that clover hay is not properly appreciated by our feeders.

In the preparation of this report analytical assistance has been rendered by Messrs. C. H. and J. E. Robinson. The results of the inspection appear in the following table:



## RESULTS OF THE FEED INSPECTION.

BRAND.	MANUFACTURED BY	Protein.		Fat.		Cost per 100 lbs.
		Guaran- teed.	Found.	Guaran- teed.	Found.	
HOMINY FEED.						
Alfalfa Meal .....	M. E. Peters Co., Omaha, Neb.....	9.-14.00	14.92	.5-1.00	1.90	\$1.60
Wirthmore Hominy Meal.....	C. M. Cox Co., Boston, Mass.....	9.5-12.00	11.41	7.5-9.00	10.00	1.70
Hominy Meal .....	Miner Hillard Co., Wilkes-Barre, Pa.....	10.-12.00	9.92	7.5-9.00	10.33	1.69
Hominy Feed .....	Mystic Milling Co., Sioux City, Ia.....	12.00	10.89	9.00	7.85	1.60
Blue Ribbon Hominy.....	J. E. Soper Co., Boston, Mass.....	10.00	10.18	8.00	6.60	....
Standard Hominy Meal.....	Standard Cereal Co., Chillicothe, O.....	11.50	11.17	8.00	8.30	1.65
Hominy Feed .....	Patent Cereal Co., Geneva, N. Y.....	10.-11.00	10.79	7.-8.00	7.50	1.65
COTTON-SEED MEAL.						
Choice Cotton-Seed Meal.....	American Cotton Oil Co.....	41.00	35.22	9.00	9.10	1.75
Dover Brand Cotton-Seed Meal.....	F. M. Brode & Co., Memphis, Tenn.....	38.-41.00	35.63	7.-9.00	6.00	1.95
Owl Brand Cotton-Seed Meal.....	F. M. Brode & Co., Memphis, Tenn.....	41.-43.00	39.90	6.-8.00	8.00	1.85
Buckeye Cotton-Seed Meal.....	Buckeye Cotton Oil Co., Cincinnati, O.....	39.-41.00	41.15	6.5-7.00	8.90	1.90
Rose Brand Cotton-Seed Meal.....	Exchange Cotton and Linseed Meal Co.....	41.-43.00	40.63	7.-9.00	10.40	1.90
Good Luck .....	S. P. Davis, Little Rock, Ark.....	38.00	45.61	9.00	10.45	1.95
Dixie Brand Cotton-Seed Meal.....	Humphrey-Godwin Co., Memphis, Tenn.....	38.5-43.00	39.45	7.-9.00	16.20	1.75
Cotton-Seed Meal .....	Hunter Bros. Milling Co.....	41.00	37.82	7.50	8.45	1.90
Imperial Cotton-Seed Meal.....	Imperial Cotton Milling Co.....	41.00	41.20	9.00	9.35	1.90
Prime Cotton-Seed Meal.....	C. C. Johnson & Co., Memphis, Tenn.....	41.00	33.69	8.00	9.37	1.85
Soper's Choice Cotton-Seed Meal.....	J. E. Soper Co., Boston, Mass.....	41.00	41.07	8.00	8.36	1.90
Cleveland Flax Meal.....	American Linseed Co., Chicago.....	36.-40.00	37.63	1.-3.00	2.60	2.00
Linseed Oil Meal.....	American Linseed Co., Chicago.....	36.-40.00	38.50	1.-3.00	4.15	2.10
Old Process Oil Meal.....	Mann Bros., Buffalo, N. Y.....	34.-40.00	35.80	6.-7.00	7.10	2.15
Ground Flax Flakes .....	C. R. Luce, Milwaukee, Wis.....	17.34	17.55	17.37	15.85	1.25
Oil Cake Feed.....	J. Loring & Co., Watertown, Mass.....	16.00	19.19	6.00	6.00	1.90

## BREWERS' AND DISTILLERS' GRAINS.

Brewers' Grains .....  
 Dearborn Distillers' Dried Grains.....  
 Union Grains .....  
 Two Ex (XX) Grains.....  
 Holstein .....

S. E. Faithful, Boston, Mass.....  
 J. W. Biles Co., Cincinnati, O.....  
 J. W. Biles Co., Cincinnati, O.....  
 J. W. Biles Co., Cincinnati, O.....  
 Hottelett & Co., Milwaukee, Wis.....

.....  
 22.-26.00  
 24.00  
 27.-30.00  
 27.00

27.80  
 26.06  
 24.44  
 30.58  
 25.37

1.50  
 1.70  
 1.80  
 1.75  
 1.45

## GLUTEN FEEDS.

Cream of Corn Gluten Feed.....  
 Clinton Feed .....

American Maize Product Co., New York.....  
 Clinton Sugar Refining Co.....  
 Corn Products Refining Co.....  
 Corn Products Refining Co.....  
 Corn Products Refining Co.....  
 Douglas & Co., Cedar Rapids, Ia.....  
 J. E. Soper & Co., Boston, Mass.....

25.00  
 23.00  
 24.-27.00  
 24.-27.00  
 24.00  
 23.00  
 22.00

25.09  
 24.24  
 25.85  
 26.23  
 26.63  
 23.00  
 21.75

2.00  
 1.80  
 1.75  
 1.75  
 1.75  
 1.80  
 5.67

## MOLASSES FEED.

Sucrene Dairy Feed.....  
 Sugarato Dairy Feed.....  
 Molac Dairy Feed.....  
 Holstein Sugar Feed.....  
 Holstein Molasses Feed.....  
 Husted Molasses Feed.....  
 Quaker Dairy Molasses Feed.....  
 Quaker Molasses Dairy Feed.....

American Milling Co.....  
 Northwest Mills Co., Winona, Minn.....  
 Quaker Oats Co.....  
 F. W. Geoke & Co., St. Louis, Mo.....  
 Husted Milling Co., Buffalo.....  
 Quaker Oats Co.....  
 Quaker Oats Co.....

16.50  
 16.-18.00  
 16.-18.00  
 15.00  
 18.-20.00  
 17.76  
 16.17

5.40  
 3.50  
 3.-5.00  
 3.-4.00  
 3.00  
 4.-6.00  
 3.70  
 3.30

1.50  
 1.35  
 1.40  
 1.35  
 1.65  
 1.45  
 1.50

## HORSE FEEDS.

Sugaroto Horse Feeds.....  
 Viko Horse Feeds.....  
 Horse Feed .....

Northwest Mills Co.....  
 J. W. Biles Co.....  
 Buffalo Cereal Co.....  
 H. O. Co., Buffalo.....  
 Chapin & Co., Boston.....

12.00  
 16.00  
 10.-12.00  
 12.00  
 7.-9.00

5.45  
 7.60  
 4.00  
 1.17  
 2.18

1.40  
 1.75  
 1.75  
 1.85  
 1.55

## DAIRY FEEDS.

Unicorn Dairy Ration .....

Ajax Milling Co., Buffalo.....  
 Ajax Milling Co., Buffalo.....  
 Clark Bros. & Co., Peoria, Ill.....  
 Great Western Cereal Co., Chicago.....

26.00  
 31.-33.00  
 28.-31.00  
 15.00

5.00  
 11.50  
 10.35  
 3.85

1.75  
 1.75  
 1.70  
 1.45

## RESULTS OF THE FEED INSPECTION.—Continued.

BRAND.	MANUFACTURED BY	Protein.		Fat.		Cost per 100 lbs.
		Guaran- teed.	Found.	Guaran- teed.	Found.	
Husted Dairy Feed.....	Husted Milling Co., Buffalo.....	20.-22.00	22.99	4.-5.00	5.90	1.65
All Grain Milk Feed.....	H. O. Co., Buffalo.....	14.00	16.28	4.00	4.07	1.65
Badger Dairy Feed.....	Chas. A. Krause Milling Co.....	16.-18.00	13.99	3.5-4.50	2.87	1.50
Empire State Dairy Feed.....	J. D. Page & Co., Syracuse, N. Y.....	32.00	24.80	11.33	11.35	1.65
Prize Dairy Feed.....	Molasses Feed Co., Milwaukee.....	38.00	17.55	3.00	1.25	1.40
Paragon Dairy Feed.....	St. Albans Grain Co.....	28.-30.00	29.31	5.-7.00	7.25	1.60
Creamery Feed.....	Buffalo Cereal Co.....	18.-20.00	19.92	4.-5.00	5.20	1.75
Jersey Mixed Feeds.....	Ind. Milling Co., Terre Haute, Ind.....	10.-12.00	11.45	2.50-3.50	2.90	1.45
STOCK AND MISCELLANEOUS FEEDS.						
Queen Stock Feed.....	A. H. Brown & Sons, Boston, Mass.....	10.-12.00	10.27	4.-5.00	6.90	1.75
Chop Feed.....	Buffalo Cereal Co.....	7.-8.00	8.03	3.-4.00	5.43	1.55
Stock Feed.....	Buffalo Cereal Co.....	8.-9.00	8.60	4.-5.00	6.95	1.65
Charlestock Feed.....	C. M. Cox, Boston, Mass.....	6.-9.00	7.41	3.-5.00	2.85	1.60
Wirthmore Stock Feed.....	C. M. Cox, Boston, Mass.....	9.-12.00	8.93	4.-5.00	6.60	1.65
Colonial Growing Feed.....	C. M. Cox, Boston, Mass.....	15.-18.00	11.89	5.-7.00	1.85	2.00
Bess Chop Feed.....	Albert Dickinson & Co., Chicago.....	10.00	10.75	3.00	3.00	2.25
Sterling Stock Feed.....	Great Western Cereal Co., Chicago.....	9.50	9.61	4.00	4.10	1.50
Extra Good Stock Feed.....	Griswold & MacKinnan, St. Johnsbury, Vt.....	10.00	10.09	4.00	1.65	1.65
Special Provender.....	Griswold & MacKinnan, St. Johnsbury, Vt.....	7.63	8.25	2.37	3.95	1.65
Haskell's Stock Feed.....	W. H. Haskell, Toledo, Ohio.....	7.63	7.32	12.97	3.25	1.65
Stock Husted Feed.....	Husted Milling Co.....	8.-10.00	9.21	4.-5.00	6.00	1.70
Imperial Corn, Oats and Barley Chop.....	Imperial Milling Co.....	8.-10.00	8.42	4.-5.00	8.47	1.65
Imperial Regal Stock Feed.....	Imperial Grain & Milling Co., Toledo.....	8.90	8.90	3.70	2.70	1.65
Imperial Steamed and Cooked Feed.....	Imperial Grain & Milling Co., Toledo.....	8.00	6.62	8.70	2.90	1.50
New Era Stock Feed.....	Noyes & Colby, Boston, Mass.....	10.00	8.65	4.00	1.70	1.85
Growing Feed.....	Park & Pollard Co., Boston, Mass.....	10.-12.00	9.36	4.-5.00	6.25	1.70
		14.-15.00	17.11	3.-4.00	4.10	2.25

Purina Mill Feed .....	11.14	3.50	2.00
Schumacher Stock Feed.....	10.62	3.10	1.65
Victor Feed .....	8.74	3.30	1.50
Jas. Brown Stock Feed.....	7.50-9.00	3.-4.00	1.60
St. Albans Grain Co.....	9.-12.00	4.-5.00	1.50
David Stott, Detroit, Mich.....	9.50	5.10	1.45
Toledo Elevator Co., Toledo, O.....	7.00	5.50	1.45
Toledo Elevator Co., Toledo, O.....	9.-12.00	3.-5.00	1.55
BEEF SCRAPS AND POULTRY FEEDS.			
Beef Scraps .....	56.20	15.89	2.75
Beef Scraps .....	38.53	20.00	2.75
Beech Soap Co., Lawrence, Mass.....	30.00	11.30	1.75
Beech Soap Co., Lawrence, Mass.....	30.00	11.95	2.75
Jos. Brock & Sons, Boston, Mass.....	43.-50.00	6.65	2.00
Bowker's Fert. Co., Boston, Mass.....	40.65	5.00	2.75
C. S. Page, Hyde Park, Vt.....	55.-65.00	15.09	3.25
John C. Dow Co., Boston, Mass.....	48.-50.00	11.05	2.55
Essex Fert. Co., Boston, Mass.....	40.11	10.02	2.70
Essex Fert. Co., Boston, Mass.....	37.75	11.10	2.35
W. D. Higgins, So. Framingham, Mass.....	28.53	10.00	2.35
Hinckley Rendering Co., Somerville, Mass.....	33.55	6.-12.00	2.50
Larrows Milling Co., Detroit, Mich.....	8.65	1.97	1.35
Manchester Rendering Co.....	8.00	5.00	1.35
Nathan Tufts & Son, Boston, Mass.....	40.-50.00	14.00	2.40
Nathan Tufts & Son, Boston, Mass.....	32.92	3.40	2.00
Park & Pollard Co., Boston, Mass.....	33.80	4.99	2.00
Park & Pollard Co., Boston, Mass.....	53.30	16.95	4.00
Parmenter & Polsey, Boston, Mass.....	60.-80.00	10.-13.00	2.45
Portland Rendering Co.....	40.-50.00	8.-12.00	3.25
Portland Rendering Co.....	45.23	6.-12.00	3.25
Swift's Lowell Fert. Co.....	40.50	3.-10.00	2.00
H. K. Webster Co., Lawrence, Mass.....	35.-45.00	11.86	2.00
Whitman & Pratt, Lowell, Mass.....	55.00	14.00	2.50
Whitman & Pratt, Lowell, Mass.....	44.42	5.55	2.50
POULTRY FEEDS.			
Chick Food .....	11.19	2.90	2.50
Poultry Feed .....	15.67	3.40	2.00
Scratching Grain .....	10.-12.00	4.-5.00	2.00
Whithmore Chick Feed.....	10.44	3.-4.00	2.05
Whitman's Poultry Mash.....	16.29	8.00	2.20
Whithmore Scratch Feed.....	13.50	3.50	2.10
Chick Feed .....	11.58	5.00	2.20
Queen Poultry Mash.....	10.27	3.00	2.50
Globe Scratch Feed.....	12.48	4.20	2.00
Globe Scratch Feed.....	11.37	3.10	2.00

## RESULTS OF THE FEED INSPECTION.—Continued.

BRAND.	MANUFACTURED BY	Protein.		Fat.		Cost per 100 lbs.
		Guaran- teed.	Found.	Guaran- teed.	Found.	
Sterling Scratch Feed.....	Great Western Cereal Co.....	10.00	10.00	3.00	3.90	\$2.10
Extra Good Scratch Feed.....	Griswold & MacKinnan.....	11.00	11.60	3.00	1.45	2.00
Competition Scratch Feed.....	Husted Milling Co.....	12.-14.00	9.95	4.-5.00	4.60	1.90
Husted Chick Feed.....	Husted Milling Co.....	12.-14.00	10.44	4.-5.00	1.85	2.00
Husted Laying Mash.....	Husted Milling Co.....	15.-17.00	16.23	3.-4.00	4.00	1.85
Husted Scratch Feed.....	Husted Milling Co.....	11.-13.00	11.11	4.-5.00	1.25	2.00
All Grain Chick Food.....	H. O. Co.....	12.00	11.97	3.00	2.55	2.25
All Grain Poultry Feed.....	H. O. Co.....	17.00	17.29	5.50	5.60	2.20
All Grain Poultry Mash.....	H. O. Co.....	17.00	17.29	5.50	4.90	2.00
All Grain Scratching Feed.....	H. O. Co.....	11.00	10.77	3.50	3.15	2.25
Dry Mash Feed.....	Park & Pollard Co.....	13.77	26.98	3.00	4.75	2.35
Gridless Chick Feed.....	Park & Pollard Co.....	10.00	11.28	2.77	3.00	2.50
Scratch Feed.....	Park & Pollard Co.....	10.00	10.44	3.00	3.50	2.25
American Poultry Feed.....	Park & Pollard Co.....	12.-14.50	12.04	3.5-4.50	6.22	2.25
Schunacher's Little Chick Feed.....	Quaker Oats Co.....	10.00	9.49	2.50	3.00	1.80
High Grade Scratching Feed.....	H. K. Webster Co., Lawrence, Mass.....	10.00	10.49	3.00	3.00	2.15
Wyandotte Chick Feed.....	Ross Bros., Worcester, Mass.....	8.25	8.30	2.25	2.95	2.25
Calf Feeds.						
Triangle Calf Feed.....	Flint Mills Co., Milwaukee.....	22.00	20.02	10.00	10.20	2.75
Schunacher's Calf Meal.....	Quaker Oats Co.....	19.-21.00	19.92	8.-9.50	8.15	3.50
Grayson Calf Meal.....	Great Western Cereal Co.....	21.00	23.22	5.00	5.90	3.00
Blatchford's Calf Meal.....	Blatchford's Calf Meal Co., Waukegan, Ill.....	25.00	28.82	5.00	5.23	3.50



## AVERAGE COMPOSITION OF COMMON CATTLE FOODS.

	Water.	Ash.	Protein.	Soluble Carbohy- drates.	Fibre.	Fat.
Alfalfa .....	8.4	7.4	14.3	46.0	25.0	14.0
* Hay, redtop .....	8.9	5.2	7.9	47.4	26.6	1.9
* Hay, timothy .....	13.2	4.4	5.9	45.0	29.0	2.5
* Hay, clover .....	15.3	6.2	12.3	38.1	24.8	3.3
* Hay, Hungarian .....	7.7	6.0	7.5	49.0	27.7	2.1
* Oat fodder .....	8.9	6.2	7.6	45.1	29.3	2.8
* Rye fodder, in bloom....	8.5	5.9	9.7	43.4	30.2	2.3
* Corn stover .....	40.1	3.4	3.8	31.9	19.7	1.1
† Corn silage .....	80.5	1.5	1.6	10.0	5.8	0.6
* Corn, N. H. Flint.....	10.1	1.5	11.6	70.2	1.1	5.5
* Corn, Western Dent.....	10.6	1.5	10.3	70.4	2.2	5.0
* Corn meal .....	15.0	1.4	9.2	68.7	1.9	3.8
¶ Hominy feed .....	9.0	2.8	11.0	65.0	3.6	8.6
* Oats, whole .....	11.0	3.0	11.8	59.7	9.5	5.0
¶ Corn and oats, pure.....	12.0	2.2	9.8	68.5	3.3	4.2
§ Wheat bran, spring.....	10.6	6.0	16.3	53.0	9.4	4.7
§ Wheat bran, winter.....	11.7	5.9	15.2	54.8	8.5	3.9
¶ Wheat middlings, white..	11.3	2.7	15.8	62.5	3.5	4.2
Wheat middlings, brown..	10.6	3.8	17.8	57.0	5.5	5.3
¶ Wheat feed .....	10.8	4.3	17.0	58.1	5.1	4.7
Gluten feed .....	8.6	1.2	26.3	53.4	6.9	3.6
Gluten meal .....	8.8	0.7	35.5	50.3	1.6	3.1
‡ Distillers' grains .....	8.8	1.8	32.1	34.9	11.0	11.4
Brewers' grains .....	8.0	3.8	23.1	49.4	10.8	4.9
‡ Malt sprouts .....	11.0	5.8	27.1	42.6	11.9	1.6
¶ Linseed meal, old process.	9.8	5.5	33.5	35.7	7.3	7.8
¶ Linseed meal, new process	9.1	5.8	35.2	38.4	8.5	3.0
¶ Cottonseed meal .....	6.9	7.2	44.6	25.1	5.6	10.6

\* Composition of American Feeding Stuffs. Jenkins and Winton.

† Analyses made at the N. H. Expt. Sta., 1895-1899.

‡ Hatch Expt. Sta. Bull., No. 94.

§ Penn. Expt. Sta. Bull., No. 48.

¶ Compiled from Feed Inspection Reports of various states.



# FERTILIZERS.



## ANALYSES OF FERTILIZERS, 1909.

---

The samples of fertilizer for the 1909 inspection were collected by Mr. A. J. Richardson, under the direction of the State Board of Agriculture. Aside from duplicates, one hundred and thirty-eight samples were taken. Nineteen of these were taken from brands that were offered for sale but were unlicensed. These samples have not been analyzed and the names and analyses do not appear in the following list.

The number of brands of fertilizer offered for sale the past year was the largest in the history of the state. If agriculture is to continue in greater favor, the number of brands will gradually increase.

The following schedule of trade values was adopted for the season of 1909 at a meeting of the station directors and chemists for use in Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, and New Jersey. These values were made from quotations obtained by consumers, and on the average are somewhat lower than the values of the preceding year.

### SCHEDULE OF TRADE VALUES FOR 1909.

	Cts. per lb.
Nitrogen in nitrates.....	16.5
Nitrogen in ammonia salts.....	17.0
Organic nitrogen in dry and finely ground fish, meat, and blood, and in mixed fertilizers.....	19.0
Organic nitrogen in fine bone and tankage.....	19.0
Organic nitrogen in coarse bone and tankage.....	14.0
Phosphoric acid, water-soluble .....	4.0
Phosphoric acid, ammonium citrate-soluble.....	4.0
Phosphoric acid in fine-ground bone and tankage....	3.5



	Cts. per lb.
Phosphoric acid in coarse bone and tankage.....	3.0
Phosphoric acid in cottonseed meal, castor pomace and ashes .....	3.0
Phosphoric acid in mixed fertilizers, insoluble in am- monium citrate .....	2.0
Potash as high-grade sulphate and in forms free from muriate or chlorides .....	5.0
Potash as muriate .....	4.25

An examination of the data in Bulletin 223 of the New Jersey Station shows the cost of these unmixed goods in that state. In other words, an inspection of 136 samples of standard unmixed products showed that the fertilizing elements were for sale and were bought in the open market at about the schedule price as fixed above. Twenty samples of nitrate of soda were for sale at such prices that the cost of the nitrogen was 16.56 cents per pound. The average cost of nitrogen in six samples of sulphate of ammonia was 15.58 cents per pound. The average cost of available phosphoric acid in fourteen samples of plain superphosphate was 3.73 cents per pound. Potash in fourteen samples of muriate of potash cost 4.04 cents per pound. In sulphate of potash the cost for three samples was 4.62 cents per pound. The cost of nitrogen in eight samples of dried blood was 19.36 cents, while in dried and ground fish the average cost of nitrogen in twenty-two samples was 20.67 cents per pound.

From data not included in this report it is certain that the materials in mixed fertilizers cost the consumers in New Hampshire from twenty to one hundred and fifty percent more than the schedule prices. A large number of brands were offered for sale at such prices that more than half the cost came from sources other than the chemicals they contained. One brand was sold for twenty-six dollars per ton, while an equal amount of unmixed chemicals represented a value of less than ten dollars. On the other hand, when the same values were applied to a different brand

offered for twenty-nine dollars per ton, the chemicals represented a value of approximately twenty-two dollars. A large number of brands selling from twenty-six dollars to thirty-two dollars per ton contained less chemicals than could be bought for fifteen dollars. The selling price may be no measure of the real value of the goods. These observations are very pointed in so far as they have a bearing upon the purchase of fertilizers. They show how imperative it is for the consumer to scrutinize carefully both the price and guarantee before placing an order.

Generally speaking, the analyses show no very great deviation from the guarantees. One sample evidently has been misbranded. The samples of one manufacturer showed conclusive evidences of very poor mixing. This introduces an element of unfairness to the consumer. While there is not the least question of the integrity of the manufacturers, it is scarcely fair for one consumer to pay for what another gets.

In many samples the calculations of the mixers have been made with such niceness that the margin of safety has been almost entirely eliminated.

A large percentage of the samples do not come up to the guarantee in regard to the available phosphoric acid. This same observation is made in most of the New England reports. We question why this is so. It is because some inferior material is used as a filler or drier, or because of some more legitimate reason.

Acknowledgment is made here to Messrs. Waldo Adams and Clearton Reynolds for their assistance in the analytical work.

The analyses of the licensed brands of fertilizers follow.



Darling's General Fertilizer	72	77	1.49	1.25	5.35	1.10	6.45	6.00	2.60	9.05	7.00	3.60	3.00
Darling's Potato Manure	1.09	1.33	2.93	2.50	4.35	1.50	6.45	6.00	2.00	9.45	8.00	3.22	3.00
Formula C	4.52	.89	5.41	.....	.....	3.05	3.05	.....	2.30	5.35	.....	20.56	5.00
Grass and Oats	.....	.....	.....	.....	4.75	5.50	10.25	11.00	2.75	13.00	.....	2.13	2.00
Grass and Oats Fertilizer	.....	.....	.....	.....	4.85	6.30	11.15	11.00	2.35	13.50	.....	7.08	7.00
Great Eastern Garden Fertilizer	1.67	1.18	2.85	3.29	4.10	2.90	7.00	8.00	3.85	10.85	.....	4.26	4.00
Great Eastern General Fertilizer	.....	.....	1.03	.80	5.55	1.95	7.50	8.00	2.25	9.75	.....	1.87	1.50
Great Eastern Northern Corn Special	.48	1.58	2.06	2.06	6.00	1.95	7.95	8.00	2.10	10.05	.....	3.06	3.00
Great Eastern Potato Manure	.....	.....	1.68	2.06	6.60	.75	7.35	8.00	3.40	10.75	.....	9.88	10.00
High Grade Fertilizer, with 10 percent potash	1.57	.96	2.53	2.40	2.65	3.00	5.65	6.00	2.75	8.40	7.00	49.05	49.00
Muriate of Potash	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nitrate of Soda	.....	.....	15.33	15.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pacific Potato Special	1.19	.94	2.13	2.06	4.60	3.55	8.15	8.00	2.00	10.15	10.00	3.10	3.00
Packer's Union Animal Corn Fertilizer	.70	2.10	2.80	2.47	5.55	.....	6.55	9.00	4.35	10.90	.....	2.50	2.00
Packer's Union Garden Complete	.80	1.73	2.53	2.40	4.50	.75	5.25	6.00	3.45	8.70	7.00	10.90	10.00
Packer's Union Potato Manure	.59	1.24	1.83	2.06	3.20	4.20	7.40	8.00	2.35	9.75	.....	6.04	6.00
Packer's Union Universal Fertilizer	.49	.66	1.15	.82	4.82	2.83	7.65	8.00	2.00	9.65	.....	4.48	4.00
Plain Superphosphate	.....	.....	.....	.....	9.70	3.85	13.55	8.00	.50	14.05	15.00	1.30	1.00
Prolific Crop Producer (Williams & Clark)	.42	1.06	1.48	1.03	4.15	4.15	8.30	8.00	3.20	11.50	10.00	.....	.....
Pure Ground Bone	.35	2.26	2.61	2.47	.25	9.35	9.60	.....	12.60	22.20	23.30	.....	.....
Quinnipiac Corn Manures	.44	1.79	2.23	2.06	7.20	10	7.30	8.00	2.35	9.65	.....	1.98	1.50
Quinnipiac Potato Phosphate	.62	1.47	2.09	2.08	5.45	4.45	9.90	8.00	1.80	11.70	10.00	3.03	3.00
Read's Farmer's Friend	.57	1.70	2.27	2.06	6.00	2.05	8.00	8.00	2.00	10.05	10.00	3.13	3.00
Read's Potato Manure	1.85	.90	2.75	2.40	4.80	.80	5.60	6.00	2.85	8.45	7.00	11.01	10.00
Read's Vegetable and Vine Fertilizer	.89	1.53	2.42	2.06	6.80	2.55	9.35	8.00	2.25	11.00	10.00	6.04	6.00
Read's Practical Potato Special	.28	.87	1.15	.82	5.75	2.05	7.80	4.00	2.20	10.00	5.00	5.40	8.00
Read's Standard Superphosphate	.34	1.11	1.45	.82	6.25	2.60	8.85	8.00	2.15	11.00	10.00	3.81	4.00
Soluble Pacific Guano	.00	1.59	2.19	2.06	6.90	.65	7.55	8.00	1.90	9.45	10.00	1.69	1.50
Special Vegetable Guano	1.00	2.31	3.31	3.30	6.15	1.90	8.05	8.00	1.50	9.55	9.00	7.22	7.00
Sulphate of Potash	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49.48	.....
Williams & Clark American Corn Phosphate	.80	1.25	2.05	2.06	5.10	2.10	7.20	8.00	3.70	10.90	10.00	1.92	1.50
Williams & Clark American Potato Manure	.94	1.19	2.13	2.06	6.25	2.85	9.10	8.00	2.60	11.70	10.00	2.83	3.00

## BOWKER FERTILIZER CO.

Bowker's Corn Phosphate	55	1.16	1.71	1.65	6.25	.85	7.10	8.00	2.05	9.15	9.00	2.14	2.00
Bowker's Early Potato Manure	1.94	.80	2.74	3.29	.51	.65	5.75	8.00	3.35	9.10	9.00	5.96	7.00
Bowker's Farm and Garden Phosphate	.67	1.17	1.84	1.65	4.55	1.65	6.20	8.00	3.30	9.50	10.00	2.13	2.00
Bowker's Fresh Ground Bone	.35	2.70	3.05	2.47	.10	8.30	8.40	10.80	14.00	22.40	22.80	.....	.....
Hill and Drill Phosphate	1.10	1.43	2.53	2.47	6.00	3.00	9.00	8.00	2.15	11.15	10.00	2.22	2.00
Bowker's Market Garden Fertilizer	1.39	1.74	3.13	2.40	3.20	2.88	6.08	6.00	2.67	8.75	7.00	9.57	10.00
Bowker's Potato and Staple Phosphate	.....	.....	.83	.82	7.35	3.25	10.60	8.00	1.95	12.60	9.00	3.55	3.00

COMPOSITION OF COMMERCIAL FERTILIZERS SAMPLED AND ANALYZED IN 1909.—Continued.

MANUFACTURER AND BRAND.	NITROGEN.			PHOSPHORIC ACID.						POTASH.		
	Inorganic.	Organic.	Total.	Soluble.	Reverted.	Available.		Insoluble.	Total.		Guaranteed.	
						Found.	Guaran- teed.		Found.	Guaran- teed.		
												Found.
<b>BUFFALO FERTILIZER CO.</b>												
Bowler's Potato and Vegetable Phosphate.....	1.40	.38	1.78	1.65	6.35	2.15	8.50	8.00	2.40	10.90	9.00	2.05
Bowler's Potato and Vegetable Phosphate.....	1.43	.35	1.78	1.65	.58	1.75	6.25	8.00	2.65	8.90	9.00	2.01
Stockbridge Manure, quick growth and forcing.....	3.50	1.26	4.76	4.93	3.25	.57	3.82	4.00	1.90	5.72	.....	6.00
Stockbridge Special Complete Manures.....	1.94	.64	2.58	2.47	3.65	1.30	4.95	4.00	2.00	6.95	6.00	10.00
Stockbridge Special Complete Corn and Grain.....	2.37	1.20	3.57	3.29	4.10	4.50	8.60	10.00	3.85	12.25	11.00	7.00
Stockbridge Special Complete Manure, for potatoes and vegetables.....	1.76	1.47	3.23	3.29	6.50	5.50	7.04	6.00	1.40	8.45	7.00	10.54
Bowler's Sure Crop.....	.07	1.22	1.29	.82	4.85	2.63	7.48	8.00	1.62	9.10	9.00	3.13
Bowler's Superphosphate, with potash.....	.....	.....	.....	.....	7.70	3.80	11.50	10.00	2.50	14.00	11.00	2.20
<b>BUFFALO FERTILIZER CO.</b>												
High Grade Manures.....	3.92	.33	4.25	3.28	4.45	2.80	7.25	7.00	1.00	8.25	8.00	9.97
New England Special.....	.86	1.12	1.98	1.64	6.75	2.65	9.40	9.00	.60	10.00	10.00	5.48
Top Dressing.....	4.44	1.32	5.76	5.74	3.15	3.25	6.40	6.00	.60	7.00	7.00	5.95
<b>COE-MORTIMER CO.</b>												
Ammoniated Bone Superphosphate.....	.....	.....	1.86	1.85	4.90	2.05	6.95	8.00	.65	7.52	9.00	3.50
E. Frank Coe's Celebrated Potato Fertilizer.....	3.75	1.15	4.90	1.65	2.30	8.20	10.50	8.00	.35	10.85	9.00	4.05
E. Frank Coe's Columbian Corn and Potato.....	.20	1.04	1.24	1.23	4.95	4.90	9.85	8.50	.65	10.15	9.50	2.06
New England Corn and Potato Fertilizer.....	.18	.68	.86	.80	3.40	1.10	4.50	7.50	2.00	6.50	8.50	3.04
E. Frank Coe's Excelsior Potato Fertilizer.....	.84	2.16	3.40	2.47	2.00	4.70	6.70	7.00	1.75	8.45	8.00	8.00
Famous Prize Brand Grain and Grass.....	.....	.....	.....	.....	3.30	5.55	8.85	8.50	.90	9.75	11.00	1.98
E. Frank Coe's Special Grass Top Dressing.....	4.26	.12	4.38	5.40	.50	1.00	1.50	.....	2.70	4.20	3.60	3.43



## PARMENTER &amp; POLSEY.

P. P. Aroostook Special.....	.81	2.92	3.73	3.69	5.45	1.80	7.25	7.00	1.20	8.45	8.00	10.96	10.00
P. P. Maine Potato Fertilizer.....			3.11	3.29	4.65	1.05	5.70	6.00	.95	6.65	7.00	11.40	10.00
P. P. Potato Fertilizer.....	.21	1.82	2.63	1.64	4.40	2.15	6.55	6.00	1.40	7.94	7.00	5.82	6.00
Plymouth Rock .....	.29	1.78	2.07	2.46	4.25	3.65	7.30	8.00	3.40	10.70	9.00	4.97	4.00

## RUSSIA CEMENT CO.

Essex Complete Manure, for potatoes, roots and vegetables.....	.72	2.31	3.63	3.70	3.25	2.95	6.20	7.00	.75	6.95	9.00	9.71	8.50
Essex A1 Superphosphate.....					1.00	3.00	6.00	7.00	5.35	11.35	9.00	1.85	2.00
Essex Complete Manure, for corn, grain and grass.....	.73	2.64	3.37	3.30	4.35	3.30	7.65	7.00	2.05	9.70	9.50	9.71	9.50
Essex XXX Fish and Potash.....	.46	1.70	2.16	2.10	1.45	10.60	12.05	9.00	2.00	14.65	12.00	2.14	3.00
Essex Market Garden and Potato Manure.....	.29	1.97	2.26	2.00	6.35	.32	7.67	8.00	1.25	8.92	10.00	5.08	5.00

## LISTER'S AGRICULTURAL CHEMICAL WORKS.

Lister's Animal Bone and Potash.....					4.40	5.60	10.90	10.00	1.75	12.65	11.00	2.68	2.00
Lister's Oneida Special .....	.76	.49	1.25	.83	3.85	3.45	7.30	7.00	2.80	10.10	8.00	1.07	1.00
Lister's Potato Manure.....	1.56	1.88	3.44	3.30	6.00	2.95	3.95	8.00	1.00	9.95	.....	7.22	7.00
Lister's Special Potato Fertilizer.....	.89	.79	1.78	1.65	4.00	3.25	7.25	8.00	2.25	9.50	9.00	3.26	3.00
Lister's Success .....	.56	.76	1.32	1.24	3.80	4.55	8.35	9.00	4.00	12.35	.....	2.64	2.00

## NEW ENGLAND FERTILIZER CO.

New England Corn Phosphate.....	.18	1.49	1.67	1.64	4.90	2.90	7.80	8.00	2.60	10.40	9.00	3.01	3.00
New England Potato Fertilizer.....	.17	1.52	1.69	1.64	4.10	1.10	5.20	7.00	1.80	7.00	8.00	4.26	4.00

## ROGERS &amp; HUBBARD CO.

Hubbard Complete Phosphate.....	.35	1.16	1.51	1.50	3.80	2.25	6.05	7.00	2.90	7.95	8.00	6.80	5.00
Hubbard Grass and Grain Fertilizer.....	.36	2.25	2.61	2.20	.85	8.55	9.40	6.50	7.15	16.55	16.00	.....	12.00
Hubbard New Market Garden.....	.62	1.42	2.04	2.00	3.25	3.45	6.70	6.00	.75	7.45	7.00	9.99	10.00
Hubbard Oats and Top Dressing.....	4.99	2.10	7.00	8.50	.30	2.50	2.80	4.50	5.60	8.40	8.00	8.62	8.00
Hubbard Soluble Potato Manure.....	3.44	1.79	5.23	5.00	1.00	6.05	7.05	7.00	3.85	10.90	10.00	6.15	5.00
Pure Raw Bone Knuckle Flour.....			3.96	3.82	.....	.....	8.55	8.55	13.85	22.40	24.50	.....	.....
Soluble Tobacco Manure.....	2.60	2.14	4.74	5.00	.50	4.75	3.25	7.00	5.50	10.75	8.00	11.06	10.00
Soluble Corn and General Crops.....	.86	1.65	2.51	2.50	2.80	3.40	6.20	6.00	3.40	9.60	8.00	9.68	8.00
Potato Phosphate .....	.81	1.31	2.12	2.00	6.10	3.50	9.60	9.00	1.25	10.85	10.00	5.91	5.00

## COMPOSITION OF COMMERCIAL FERTILIZERS SAMPLED AND ANALYZED IN 1909.—Continued.

MANUFACTURER AND BRAND.	NITROGEN.			PHOSPHORIC ACID.						POTASH.		
	Inorganic.	Organic.	Total.	Soluble.	Inverted.	Available.		Insoluble.	Total.		Guaranteed.	
						Found.	Guaran- teed.		Found.	Guaran- teed.		
J. W. SANBORN.												
Sanborn's Chemical Fertilizer, for grass and grain.....	4.10	.76	4.86	1.70	3.15	4.85	5.00	1.00	5.85	6.00	6.23	6.00
Sanborn's Chemical Fertilizer, for grass and grain.....	3.44	1.79	5.23	1.90	5.35	7.25	5.00	.50	5.85	6.00	6.70	6.00
Sanborn's Chemical Fertilizer, for potato and corn.....			4.21	3.50	5.00	6.70	7.00	2.75	9.45	10.00	10.90	8.00
Sanborn's Chemical Fertilizer, for potato and corn.....	1.94	1.39	3.33	5.20	1.70	6.90	7.00	3.75	10.65	10.00	7.72	8.00
Sanborn's Chemical Fertilizer, for use in hill.....	1.62	.85	2.47	6.15	2.20	7.50	7.50	5.60	13.10	12.50	4.54	4.00
Sanborn's Chemical Fertilizer, for use in hill.....	.49	2.66	3.15	1.75	3.75	5.50	7.50	3.75	9.25	12.50	4.97	4.00
SWIFT'S LOWELL FERTILIZER CO.												
Empress .....	.15	1.30	1.45	6.00	1.40	7.40	7.00	1.15	8.55	8.00	2.38	2.00
Swift's Lowell Animal Brand, for all crops.....	.28	2.11	2.39	4.00	5.00	9.00	8.00	.95	9.95	10.00	4.23	4.00
Swift's Lowell Bone Fertilizer, for corn and grain.....	.28	1.36	1.64	6.90	.73	7.63	8.00	2.92	10.55	.....	3.02	3.00
Swift's Lowell Cereal Brand.....	.12	1.06	1.18	.82	5.25	7.00	7.00	1.10	8.10	8.00	1.91	1.00
Swift's Lowell Potato Manure.....	.24	1.64	1.88	4.10	2.95	7.05	7.00	1.20	8.25	8.00	4.00	4.00
Swift's Lowell Potato Phosphate.....	1.19	1.27	2.46	6.85	.72	7.57	8.00	1.70	9.27	9.00	5.89	6.00
Swift's Lowell Starting Phosphate.....	.....	.93	.82	3.25	2.87	6.12	8.12	2.10	8.22	9.00	4.12	4.00

## INSPECTION OF FERTILIZERS FOR 1910.

---

The samples of fertilizer for the 1910 inspection were collected under the direction of the State Board of Agriculture and turned over to the experiment station for analysis. Samples from one hundred and thirty-eight brands of chemicals and mixed fertilizers have been reported. The same number of brands were offered for sale in 1910.

Numerous inquiries are received at the experiment station concerning the merits of individual brands of fertilizers, as well as comparative values of different brands. An investigation of the prices at which the various brands of fertilizers are retailed shows that the careful buyer has a great advantage over the less careful. Three brands of fertilizer having practically the same guaranteed analyses were offered for sale at the rate of \$1.40, \$1.50, and \$1.70 per hundred pounds, or \$28, \$30, and \$34 per ton respectively. The lower price no doubt represented a fair profit to the manufacturer and dealer. Fifty cents would cover the difference in the calculated values for a ton of these fertilizers.

As a basis for making a comparative study of different brands of fertilizers, the following facts are useful:

In 1910 the following retail prices were made:

Nitrate soda,	15% nitrogen,	\$2.50	per hundred pounds
Muriate of potash,	50% potash	2.10	" " "
Acid phosphate,	14% available,	.80	" " "

At this rate the nitrogen, potash, and phosphoric acid could be had for 16.6 cents, 4.2 cents, and 5.7 cents per pound respectively. It must be remembered that these

figures represent the cost in the unmixed chemicals. When these prices or figures are applied to the ready-mixed fertilizers it will be found that the value will represent about 60% of the usual selling price. In other words, the cost of the potash, phosphoric acid and nitrogen has been increased about 40% by the mixing process.

Of the brands of fertilizers collected in 1910, the retail selling prices of 94 brands of complete mixed fertilizers were obtained. The price and average guaranteed percentage of nitrogen, available phosphoric acid and potash were calculated with the following results: Nitrogen, 2.36%; available phosphoric acid, 6.83%; potash, 5.07%; average selling price, \$1.60 per hundred pounds.

The consumer might have obtained the same amount of nitrogen, phosphoric acid, and potash in the unmixed condition for 93 cents.

Stated otherwise, the average consumer who buys unmixed goods gets as much in the unmixed condition for 93 cents as the consumer of ready-mixed goods gets for \$1.60.

These figures represent averages. There are instances where fertilizers are offered for sale at more than double the retail cost of the chemicals in the unmixed condition. Some of the high-grade mixtures were offered for sale at almost double the retail cost of the chemicals they contained. These, in some instances, are mechanical mixtures of nitrate of soda, acid phosphate, and muriate of potash.

Heretofore it has been pointed out in these reports that the economical consumer would buy the high-grade mixtures; unless much care is exercised at the present time the consumer will pay more for the high-grade mixtures than they are worth when compared with other mixtures. In other words, it is for the consumer to scrutinize the guarantee tags carefully in connection with the price.

The brands of fertilizers inspected for 1910 show no great variations from the guaranteed analysis. It is evident that the manufacturers intend to have the analysis represent the quality of the goods offered for sale.

Analytical assistance has been rendered by Messrs. J. E. Robinson and C. H. Robinson in the preparation of this report.



COMPOSITION OF COMMERCIAL FERTILIZERS SAMPLED AND ANALYZED IN 1910.

MANUFACTURER AND BRAND.	NITROGEN.			PHOSPHORIC ACID.						POTASH.	
	Inorganic.	Total.		Soluble.	Reverted.	Available.		Total.			
		Organic.	Pound.			Guanam- teed.	Pound.	Guanam- teed.	Pound.	Guanam- teed.	Pound.
American Potato Manure .....	1.49	.60	2.09	2.06	7.67	7.90	8.00	2.10	10.00	9.00	3.21
Bradley's Complete Manure for Corn and Grain .....	2.99	.29	3.28	3.29	10.57	12.25	12.00	1.25	13.50	13.00	3.00
Bradley's Comp. Manure for Potatoes & Vegetables .....	2.22	1.01	3.23	3.20	6.66	8.17	8.00	1.50	9.67	9.00	7.12
Bradley's Comp. Manure Top Dressing Grass & Grain .....	4.25	.00	4.25	4.94	4.19	2.61	6.80	1.02	7.82	6.00	3.69
Bradley's Complete Manure with 10% Potash .....	2.12	1.16	3.28	3.23	6.56	1.67	8.23	2.60	10.23	7.00	7.30
Bradley's Corn Phosphate .....	.67	1.43	2.10	1.65	6.80	1.00	7.80	2.65	10.45	9.00	1.87
Bradley's Eclipse Phosphate .....	.46	.57	1.03	1.03	6.80	1.92	8.72	8.00	1.90	10.62	2.98
Bradley's Grass and Lawn Top Dressing .....	3.58	.00	3.58	3.91	3.30	2.72	5.72	5.00	1.25	6.97	2.44
Bradley's Potato Fertilizer .....	1.33	.86	2.19	2.06	6.30	1.31	7.61	8.00	1.70	9.31	3.05
Bradley's Potato Manure .....	1.67	1.07	2.74	2.47	6.22	1.43	7.65	6.00	1.90	9.55	7.00
Bradley's X L Super-Phosphate .....	1.63	.96	2.59	2.47	8.40	1.30	9.70	7.00	2.55	12.25	6.14
Clark's Cove Bay State G. G. ....	1.06	1.05	2.11	2.05	6.80	1.45	8.25	8.00	2.25	10.00	5.00
Clark's Cove Potato Fertilizer .....	1.14	.81	1.95	2.05	7.05	1.52	8.57	8.00	2.25	10.80	2.35
Cleveland Fertilizer for all crops .....	.48	.69	1.17	1.60	6.30	2.08	8.38	8.00	2.47	10.85	9.00
Cleveland Potato Phosphate .....	1.49	.48	1.97	2.06	7.50	1.48	8.98	8.00	2.47	11.45	9.00
Crocker's Super-Phosphate .....	.79	1.58	2.37	2.06	6.80	1.92	8.72	8.00	2.65	10.92	3.38
Crocker's Ammoniated Corn Phosphate .....	.74	1.53	2.27	2.06	6.00	2.27	8.93	8.00	2.50	10.92	1.63
Crocker's New Rival Ammon't'd Bone Sup'r-P'h's-ph'te .....	1.07	.61	1.31	1.03	6.20	2.73	8.93	8.00	1.87	10.80	1.50
Crocker's Potato, Hop and Tobacco Phosphate .....	1.70	.99	2.05	2.06	6.30	2.82	9.22	8.00	2.50	11.72	2.00
Crocker's Special Potato Manure .....	1.88	1.11	2.99	3.29	5.30	7.22	6.02	6.00	2.30	7.32	3.37
Cumberland Potat Fertilizer .....	1.13	1.00	2.13	2.06	6.50	2.55	9.05	8.00	1.70	10.75	3.00
Cumberland Super-Phosphate .....	1.80	1.35	2.21	2.06	6.40	1.95	8.35	8.00	2.25	10.60	2.98
Darling's Blood, Bone and Potash .....	1.73	3.18	4.91	4.11	5.90	.15	6.05	7.00	2.75	8.80	1.58
Darling's Farm Favorite .....	1.61	.53	2.14	2.06	7.30	1.14	8.54	8.00	2.35	10.89	1.77
Darling's General Fertilizer .....	.71	.85	1.56	1.23	6.82	2.47	8.29	6.00	1.65	9.94	3.36
Darling's Potato Manure .....	1.62	1.28	2.90	2.47	6.10	1.90	8.09	6.00	1.02	9.11	4.68
Formula B. Seeding Down .....	1.93	1.24	3.17	3.00	4.30	3.30	5.60	.....	7.17	12.77	5.00
Grass and Oats Fertilizer .....	.....	.....	.....	.....	8.30	3.17	11.97	.....	2.70	14.87	13.80
Great Eastern Garden Special .....	2.26	.77	3.08	3.29	6.80	1.37	8.17	8.00	1.95	9.92	2.60
Great Eastern General Fertilizer .....	.76	.30	1.06	.92	5.50	2.00	8.50	8.00	2.97	11.47	6.43
Great Eastern Northern Corn Special .....	1.45	1.01	2.46	2.06	7.55	1.64	9.19	8.00	1.73	11.94	3.65

Great Eastern Potato Manure	1.47	.61	2.08	2.06	7.45	1.98	9.43	8.00	1.97	11.40	9.00	3.21	3.00
Ground Bone	.33	2.69	3.02							22.95	22.88	43.22	48.00
High Grade Sulphate of Potash												9.43	10.00
High Grade with 10% Potash	1.30	1.10	2.40	2.47	5.30	.70	6.00	6.00	1.23	7.23	7.00	51.80	50.00
Muriate of Potash													
Nitrate of Soda	15.11			15.00									
Pacific Potato Special	1.35	.63	1.98	2.06	7.62	2.39	10.01	8.00	2.35	12.36	9.00	3.35	3.00
Packer's Union Animal Corn Fertilizer	1.55	.94	2.49	2.47	7.90	1.92	9.82	9.00	2.40	12.62	10.00	9.36	2.00
Packer's Union Gardener's Complete Manure	1.08	1.29	2.37	2.47	5.50	1.88	7.38	6.00	2.15	9.52	7.00	9.23	10.00
Packer's Union Potato Manure	.91	1.18	2.09	2.05	7.25	2.05	9.30	8.00	1.87	11.17	9.00	6.04	6.00
Packer's Union Universal	.52	.60	1.12	.32	7.20	1.30	8.50	8.00	1.87	10.37	9.00	3.81	4.00
Plain Super-Phosphate					9.82	6.38	16.20	14.00	1.45	17.65	15.00		
Quinnipiac Corn Manure	.72	1.67	2.39	2.06	8.05	1.45	9.50	8.00	1.82	11.32	9.00	1.75	1.50
Quinnipiac Potato Phosphate	1.56	1.82	2.38	2.06	5.40	1.69	7.09	8.00	3.13	10.24	9.00	3.35	3.00
Read's Farmer's Friend Super-Phosphate	1.15	.88	2.05	2.06	8.15	1.59	9.74	8.00	1.60	11.34	9.00	3.40	3.00
Read's Potato Manure	1.28	1.07	2.35	2.47	5.60	2.17	7.67	6.00	1.65	9.32	7.00	10.00	10.00
Read's Practical Potato Special Fertilizer	.65	.88	1.53	.82	6.32	1.67	7.99	4.00	1.75	9.74	5.00	8.72	8.00
Read's Standard Super-Phosphate	.50	.46	.96	.82	6.70	2.07	8.77	9.00	2.35	11.12	9.00	4.20	4.00
Read's Vegetable and Vine Fertilizer	1.20	.92	2.12	2.06	7.10	.90	8.00	8.00	2.60	10.60	9.00	6.19	6.00
Soluble Pacific Guano	2.14		2.12	2.06	6.80	2.45	8.85	8.00	1.90	10.75	9.00	1.65	1.50
Special Vegetable Guano	2.16	1.16	3.32	3.29	6.40	1.94	8.34	8.00	2.15	10.49	9.00	7.20	7.00
Williams & Clark American Corn Phosphate	1.02	1.23	2.25	2.06	6.35	1.92	8.27	8.00	1.70	9.97	9.00	1.75	1.50

## BOWKER FERTILIZER CO.

Bowker's Corn Phosphate	.99	.90	1.89	1.65	6.75	2.49	9.24	8.00	1.42	11.66	9.00	2.01	2.00
Bowker's Farm and Garden Phosphate	1.30	.73	2.03	1.65	7.10	1.82	8.92	8.00	1.55	10.47	9.00	2.33	2.00
Bowker's Highly Nitrogenized	8.20		8.30	8.23	1.10	4.45	5.55	7.00	3.30	8.85	8.00	.90	8.00
Bowker's Hill & Drift Phosphate	1.34	1.04	2.38	2.47	6.80	1.60	8.40	9.00	2.40	10.80	10.00	2.03	2.00
Bowker's Potato and Vegetable Phosphate	.92	.80	1.72	1.55	7.20	1.50	8.00	8.00	2.40	11.00	9.00	2.17	2.00
Bowker's Sure Crop Bone Phosphate	.86	.52	1.38	.82	6.50	1.90	8.40	8.00	2.15	10.55	9.00	2.17	2.00
Stockbridge Complete Manure	2.48	.64	3.12	3.20	3.35	6.27	6.00	6.00	1.50	7.77	7.00	10.24	10.00
Stockbridge for Corn and all Grain Crops	2.16	.74	3.00	3.29	7.62	3.38	11.00	10.00	1.44	11.44	11.00	7.02	7.00
Stockbridge Manure Top-Dressing and Forcing	3.16	1.64	4.80	4.94	3.50	1.04	4.54	4.00	1.35	6.49	6.00	6.02	6.00
Stockbridge Special Complete Manure	1.17	1.17	2.34	2.47	3.30	2.65	5.96	6.00	2.65	8.61	9.00	10.03	10.00
Stockbridge Special Complete Manure Seeding					4.70	1.45	7.50	7.00	1.35	7.50	7.00	10.04	10.00
Stockbridge Special Complete Potatoes & Vegetables													
Bowker's Super-Phosphate with Potash	2.61	.58	3.19	3.29	9.10	2.02	11.12	10.00	2.30	13.42	11.00	2.23	2.00

## BUFFALO FERTILIZER CO.

Celery and Potato Special	.69	1.06	1.75	1.64	4.10	3.90	8.00	8.00	1.90	9.90	9.00	10.15	10.00
High Grade Manure	2.42	1.77	4.19	3.30	4.90	2.10	7.00	7.00	1.25	9.25	9.00	6.86	6.00
New England Special			1.81	1.64	4.90	2.10	7.00	9.00	2.60	9.60	9.00	5.92	10.00

COMPOSITION OF COMMERCIAL FERTILIZERS SAMPLED AND ANALYZED IN 1910.—Continued.

MANUFACTURER AND BRAND.	NITROGEN.			PHOSPHORIC ACID.						POTASH.			
	Inorganic.	Organic.	Total.	Soluble.	Reverted.	Available.		Insoluble.	Total.		Found.	Guaranteed.	
						Found.	Guaran- teed.		Found.	Guaran- teed.			
COE-MORTIMER FERTILIZER CO.													
Basic Slag Phosphate.....					4.78	4.78	15.00	12.25	17.03	17.00			
E. Frank Coe's Celebrated Special Potato Fertilizer.....	.68	.78	1.46	1.55	4.05	2.95	7.00	8.00	2.65	9.65	9.00	4.31	4.00
E. Frank Coe's Columbian Corn and Potato Fertilizer.....	.19	1.13	1.32	1.23	6.05	3.42	9.47	8.50	1.75	11.22	9.00	2.73	2.50
E. Frank Coe's Complete Manure with 10% Potash.....	1.27	.95	2.22	2.47	5.50	4.35	4.85	6.00	2.35	7.80	6.00	9.72	10.00
E. Frank Coe's Gold Brand Excelsior Guano.....	1.35	.52	2.47	2.47	5.82	2.83	8.65	8.00	1.30	9.95	9.00	7.52	6.00
Excelsior Potato Fertilizer.....	1.45	.90	2.35	2.47	2.20	4.40	6.60	7.00	1.90	8.50	7.00	7.18	5.00
High Grade Ammoniated Bone Super-Phosphate.....	2.03	.61	2.94	1.85	2.20	5.45	7.65	8.00	1.35	9.01	9.00	4.46	3.00
New England Corn and Potato Fertilizer.....	.16	.81	.97		5.60	.95	6.55	7.50	4.20	10.75	8.00	2.40	3.00
Nitrate of Soda.....	15.08			15.00									
E. Frank Coe's XXV Ammoniated Bone Phosphate.....	.09	.82	.91	.80	5.95	4.03	9.98	8.50	1.32	11.30	9.50	1.71	1.50
ESSEX FERTILIZER CO.													
Essex Complete Manure Corn, Grain and Grass.....	.81	2.76	3.57	3.28	4.90	1.21	6.10	6.00	1.00	7.10	7.00	9.30	10.00
Essex Market Garden Potato Manure.....	.62	1.67	2.19	2.00	5.55	3.11	8.66	8.00	1.25	9.91	9.00	5.00	5.00
Essex Comp. Manure Potatoes, Roots & Vegetables.....	.80	2.37	3.17	3.28	4.90	1.40	6.30		1.50	7.80	7.00	9.75	10.00
Essex Peerless Potato Manure.....	.78	2.33	3.11	4.10	5.45	2.60	7.05	7.00	1.20	8.25	8.00	9.80	8.00
Essex XXX Fish and Potash.....	.13	1.51	1.81	2.00	5.40	2.62	8.02	8.00	2.00	10.02	9.00	3.07	3.00
LISTER'S AGRICULTURAL CHEMICAL CO.													
Lister's Grain and Grass.....			20		9.20	1.99	11.19	10.00	2.37	13.56	11.00	2.04	2.00
Lister's High Grade Special for Spring Crops.....	1.11	1.02	2.13	1.65	6.40	1.95	8.35	8.00	1.55	9.90	9.00	10.00	10.00
Lister's Special Corn.....	1.12	.60	1.72	1.33	6.30	2.08	8.38	8.00	2.67	10.45	9.00	8.31	3.00
Lister's Potato Manure.....	2.34	.78	3.12	3.29	6.70	.66	7.36	8.00	1.70	9.06	9.00	7.01	7.00
Lister's Special Potato Fertilizer.....	1.05	.53	1.58	1.65	7.70	1.17	8.87	8.00	1.85	10.72	9.00	3.43	3.00

Lister's Success .....	1.04	.68	1.72	1.23	6.25	3.67	9.92	1.73	11.65	10.00	1.81	2.00
Lister's 10% Potato Grower .....	1.92	.34	3.26	3.29	4.90	1.85	6.75	6.00	1.95	8.70	7.00	9.73
NEW ENGLAND FERTILIZER CO.												
New England Corn and Grain Fertilizer .....	.13	1.55	1.68	1.23	4.55	2.78	7.33	7.00	1.87	9.20	8.00	1.72
New England Corn Phosphate .....	.47	1.15	1.62	1.64	6.10	2.10	8.20	8.00	2.00	10.20	9.00	2.89
New England High-Grade Potato Fertilizer .....	.22	2.58	2.80	2.46	5.40	2.99	8.39	8.00	2.12	10.51	9.00	5.42
Nitrate of Soda .....	15.44	.....	.....	15.00	.....	.....	.....	.....	.....	.....	.....	6.00
New England Peerless Fertilizer .....	.05	1.08	1.13	.82	4.80	3.26	8.06	7.00	1.28	9.34	8.00	1.25
New England Potato Fertilizer .....	.51	1.20	1.71	1.64	5.13	2.87	8.00	7.00	1.26	8.26	8.00	3.78
New England Potato Grower .....	.25	2.02	2.27	2.46	4.80	1.30	6.10	6.00	2.12	8.22	7.00	10.05
NITRATE AGENCY CO.												
Nitrate of Soda .....	15.16	.....	.....	15.00	.....	.....	.....	.....	.....	.....	.....	50.10
Muriate of Potash .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	48.85
Sulphate of Potash .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	48.00
PARMENTER & POLSEY.												
Dissolved Bone Black .....	.....	.....	.....	.....	13.30	2.68	15.98	15.00	.77	16.75	.....	.....
Dried Blood .....	.....	.....	5.89	9.54	.....	.....	.....	.....	.....	.....	.....	.....
Ground Tankage .....	.....	.....	6.14	5.00	.20	5.50	5.70	14.00	8.90	14.60	.....	.....
Muriate of Potash .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	52.85
Nitrate of Soda .....	15.57	.....	.....	15.00	.....	.....	.....	.....	.....	.....	.....	50.00
Parmenter & Polsey Grain Grower .....	.05	1.45	1.50	1.23	5.10	3.00	7.20	7.00	1.80	9.60	8.00	2.22
Parmenter & Polsey Potato Grower .....	.17	2.29	2.46	2.46	3.30	2.10	6.00	6.00	1.75	7.75	7.00	9.7
Parmenter & Polsey Potato Fertilizer .....	.14	1.73	1.87	1.64	4.00	1.45	5.45	.....	1.95	7.40	7.00	5.53
Plymouth Rock Brand .....	.57	1.66	2.33	2.46	6.77	1.13	7.90	8.00	1.57	9.47	9.00	4.20
Star Brand Super-Phosphate .....	.46	1.26	1.72	1.54	4.70	1.86	6.56	7.00	1.15	7.71	8.00	3.76
Sulphate of Ammonia .....	20.33	.....	.....	20.00	.....	.....	.....	.....	.....	.....	.....	48.00
Sulphate of Potash .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
ROGERS & HUBBARD CO.												
Hubbard's Complete Phosphate .....	.35	1.68	1.43	1.50	4.60	2.79	7.39	7.00	2.80	10.19	8.00	5.87
Grass and Grain Fertilizer .....	.21	2.01	2.22	2.20	.....	.....	9.50	6.50	11.16	21.10	16.00	11.09
Oats and Top Dressing .....	6.77	1.45	8.22	8.70	.....	4.2	4.57	4.50	6.35	10.87	8.00	8.00
Hubbard's New Market Garden Phosphate .....	1.11	.85	1.96	2.00	4.00	3.04	7.04	6.00	2.06	9.10	8.50	10.84
Hubbard's Raw Knuckle Bone Flour .....	.10	3.67	3.77	3.50	.....	4.45	4.45	.....	20.30	24.75	24.50	.....
Hubbard's Soluble Bone Flour .....	1.53	2.49	4.02	5.00	2.11	4.95	7.05	7.00	6.30	13.35	10.00	5.85
Hubbard's Soluble Tobacco Manure .....	1.84	2.74	4.58	5.00	1.20	4.59	5.79	7.00	7.65	13.41	10.00	8.87

COMPOSITION OF COMMERCIAL FERTILIZERS SAMPLED AND ANALYZED IN 1910.—Continued.

MANUFACTURER AND BRAND.	NITROGEN.				PHOSPHORIC ACID.						POTASH.		
	Inorganic.	Organic.	Total.		Soluble.	Reverted.	Available.		Insoluble.	Total.		Found.	Guaranteed.
			Found.	Guaran- teed.			Found.	Guaran- teed.		Found.	Guaran- teed.		
Potato Phosphate .....	.98	1.14	2.12	2.00	5.80	4.55	10.35	9.00	3.17	13.52	10.00	5.54	5.00
Soluble Corn and General Crops.....	1.09	1.41	2.50	2.50	3.30	4.14	7.44	6.00	2.52	9.96	8.00	8.98	8.00
J. W. SANBORN.													
Sanborn's Chemical Fertilizer for Potatoes and Corn .....	2.04	1.23	3.27	3.50	5.60	1.86	7.46	7.00	1.75	9.21	10.00	7.11	8.00
Sanborn's Chemical Fertilizer for Use in the Hill .....	1.39	1.16	2.55	2.50	5.00	1.37	6.37	7.30	4.50	10.87	12.00	4.17	4.00
Sanborn's Chemical Fertilizer for Grass and Grain.....	5.14	...	5.14	5.15	4.00	.92	4.92	4.00	3.00	7.92	7.00	5.30	6.00
SWIFT'S LOWELL FERTILIZER CO.													
New England Dissolved Bone and Potash.....	.14	2.05	2.19	1.64	6.20	2.64	8.84	9.00	2.78	11.62	10.00	2.24	2.00
Swift's Lowell Animal Brand .....	.11	2.41	2.52	2.45	5.75	2.60	8.35	8.00	2.05	10.40	10.00	4.09	4.00
Swift's Lowell Bone Fertilizer for Corn and Grain .....	.46	1.03	1.49	1.64	5.90	2.28	8.18	8.00	1.70	9.88	9.00	3.27	3.00
Swift's Lowell Cereal Brand .....	.03	.96	.99	.88	4.75	2.25	7.00	7.00	1.37	8.37	8.00	1.15	1.00
Swift's Lowell Empress Brand.....	.12	1.17	1.29	1.29	2.50	3.62	6.12	7.00	2.50	8.62	8.00	2.09	2.00
Swift's Lowell Ground Bone.....	.00	2.52	2.52	2.47	...	...	9.60	...	11.00	20.60	23.00	...	...
Swift's Lowell Lawn Dressing.....	3.74	.21	3.95	4.00	6.20	.80	7.00	7.00	1.50	8.50	8.00	5.57	6.00
Swift's Lowell Potato Fertilizer .....	.54	1.87	2.41	2.46	6.47	1.45	7.92	8.00	1.45	9.37	9.00	5.76	6.00
Swift's Lowell Potato Manure.....	.39	1.29	1.68	1.64	5.05	1.74	6.79	7.00	1.33	8.12	...	4.00	4.00
Swift's Lowell Potato Grower .....	.60	2.52	3.12	3.28	4.40	2.82	7.22	6.00	1.60	8.82	7.00	10.22	10.00
Swift's Perfect Tobacco Grower .....	.76	2.85	3.61	4.00	2.50	1.20	3.70	4.00	1.80	5.50	5.00	6.38	6.00
Sterling Phosphate.....	.05	1.02	1.07	.82	5.80	3.42	9.02	8.00	1.90	10.92	8.00	3.82	4.00
Swift's Special Potato Fertilizer.....	.11	2.04	2.15	2.45	3.50	2.56	6.06	6.00	2.65	8.71	...	10.37	.....
WHITMAN & PRATT.													
Pure Ground Bone.....	.51	2.09	2.60	2.47	...	...	13.25	...	13.85	27.10	.....	.....	.....



SEEDS.



## SEED TESTS.

---

The seed tests herewith reported were made under the provisions of the Pure Seed Law enacted by the General Court in 1909. This law was the outcome of the general agitation for a better quality of agricultural seeds which is being made by those interested all over the country, and New Hampshire may congratulate herself upon being in the van of such a progressive movement. A number of other states have enacted similar laws which have operated for the improvement of seeds in regard to both purity and vitality, and so satisfactory have been the results that the indications are that it is only a matter of time until we shall have federal legislation establishing seed control stations which shall have supervision of all seeds offered for sale in any state.

Seed laboratories have been in operation in Germany for a long time, and as a result much of the seed which was unmarketable under the German regulations has been exported to the United States and used in the adulteration of the better grades of domestic-grown seeds. Our farmers are beginning to realize the importance of good seeds and of knowing something about the kind and amount of impurities which may be contained in them as well as the percentage of them which will germinate.

During the year 238 samples of seed were examined, 51 of these for both purity and germination, 185 for germination only, and 2 for purity only. It should be stated that we do not attempt to determine the purity of different varieties of corn, oats, barley, peas, beans, melons, etc., except as to the

amount of dirt they contain, because this can only be done by having these seeds reproduce their plants and fruit.

The writer desires to acknowledge his appreciation of the work of Mr. W. L. Slate, Jr., assistant in agronomy, who made the tests and examinations of the samples herewith reported.

## SEED EXAMINATION, 1910.

Sample No.	Kind of Seed, Sender, Date of Report, and Kind and No. of Foreign Seeds Found in One Pound.	Percent of Pure Seed.	Percent of Weed Seed.	Percent of Other Grass Seeds.	Percent of Inert Matter.	Percent of Germination.
1	Alsike clover (P. A.)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 9, '09. Docks, 227; Canada bluegrass, 1,816; ribgrass, 681; sorrel, 10,000; timothy, 108,863.	85.3	1.95	9.05	3.6	70.0
2	Alsike clover (Fancy)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 9, '09. Redtop, 888; sorrel, 681; timothy, 6,356.	98.7	trace	.45	.8	77.0
3	Millet (German)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 9, '09. Crabgrass, 1,092; smartweed, 273; yellow fox- tail, 455.	98.7	.5	.0	.7	87.2
4	Timothy (Gold Medal)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 9, '09. Alsike clover, 227.	99.5	.0	trace	.5	96.5
5	Timothy (Pan American)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 9, '09. Alsike clover, 908; purslane, 227.	99.5	trace	.15	.33	95.7
6	Millet (Japanese)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 9, '09. Crabgrass, 1,270; spiny sida, 635; smartweed, 1,270; yellow foxtail, 1,453.	98.0	1.7	.0	.3	91.5
7	White clover (Fancy)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 9, '09. Alsike clover, 2,270; chickweed, 908; ribgrass, 454; smartweed, 25,427; sorrel, 681.	95.3	2.9	trace	1.7	88.0
8	Timothy (Choice)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 9, '09. Canada blue- grass, 454; red clover, 1,816; red- top, 227.	99.2	trace	.25	.4	94.0
9	Millet (Common)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 9, '09.	97.5	.0	.0	2.4	87.7
10	Red clover (Pan American)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 13, '09. Alsike clover, 227; sorrel, 227; yellow foxtail, 227.	99.7	.1	trace	.15	83.7
11	Alfalfa (Fancy)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 13, '09. Chicory, 272; wild sunflower, 272; ribgrass, 362; yellow trefoll, 635.	97.4	.5	.0	2.04	96.0
12	Redtop (Fancy)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 13, '09. Timothy, 908.	95.0	.0	trace	4.9	56.7
13	Millet (Hungarian)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 13, '09. Lady's thumb, 273; lambs-quarters, 182; Charlock, 273; pigweed, 1,000; ragweed, 182; smartweed, 182; timothy, 726; yel- low foxtail, 182.	98.5	.3	.1	1.0	82.0



SEED EXAMINATION, 1910.—*Continued.*

Sample No.	Kind of Seed, Sender, Date of Report, and Kind and No. of Foreign Seeds Found in One Pound.	Percent of Pure Seed.	Percent of Weed Seed.	Percent of Other Grass Seeds.	Percent of Inert Matter.	Percent of Germination.
14	Redtop (Choice) ..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 13, '09. Alsike clover, 1,816; cinquefoil, 49,032; mouse eared chickweed, 1,816; timothy 177,970.	82.0	1.2	8.0	7.8	50.5
15	Red clover (Eureka) ..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Dec. 13, '09. Alsike clover, 1,635; Kentucky bluegrass, 91; ragweed, 91; smartweed, 91; miscellaneous, 545.	98.3	.2	.3	1.1	86.7
16	Redtop (Fancy "3") ..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Jan. 11. Cinquefoil, 908; timothy, 122,580; yarrow, 8,626.	84.9	.3	6.5	8.3	43.2
17	Red clover (White Mountain) ..... Holbrook Grocery Co., Keene, N. H. Jan. 18. Green foxtail, 181; timothy, 181.	99.7	.1	trace	.2	94.0
18	Oats (White Mountain) ..... Holbrook Grocery Co., Keene, N. H. Jan. 18.	....	....	....	....	98.5
19	Timothy (White Mountain) ..... Holbrook Grocery Co., Keene, N. H. Jan. 18. Plantain, 252.	99.7	trace	.0	.3	95.5
20	Red clover (White Mountain) ..... Holbrook Grocery Co., Keene, N. H. Jan. 18. Alsike clover, 454; sorrel 181; timothy, 272; yellow foxtail 181.	99.2	.1	.2	.5	89.5
21	Alsike clover (White Mountain) ..... Holbrook Grocery Co., Keene, N. H. Jan. 18. Red clover, 454; timothy 21,672.	97.8	.0	2.1	trace	90.0
22	Redtop (White Mountain) ..... Holbrook Grocery Co., Keene, N. H. Jan. 29. Timothy, 6,356.	93.6	.0	.2	6.2	63.3
23	Beans (Pole Hort.) ..... Holbrook Grocery Co., Keene, N. H. Feb. 5.	....	....	....	....	53.5
24	Peas (Sir Thos. Laxton) ..... Holbrook Grocery Co., Keene, N. H. Feb. 5.	....	....	....	....	64.5
25	Beans (Dwarf Long Yellow) ..... Holbrook Grocery Co., Keene, N. H. Feb. 5.	....	....	....	....	99.8
26	Beans (Dwarf Hort.) ..... Holbrook Grocery Co., Keene, N. H. Feb. 5.	....	....	....	....	82.0
27	Beans (Currie's Rust Proof) ..... Holbrook Grocery Co., Keene, N. H. Feb. 5.	....	....	....	....	91.0
23	Peas (Tall Telephone) ..... Holbrook Grocery Co., Keene, N. H. Feb. 5.	....	....	....	....	49.0
29	Beans (Dwarf Golden Wax) ..... Holbrook Grocery Co., Keene, N. H. Feb. 5.	....	....	....	....	85.5

SEED EXAMINATION, 1910.—*Continued.*

Sample No.	Kind of Seed, Sender, Date of Report, and Kind and No. of Foreign Seeds Found in One Pound.	Percent of Pure Seed.	Percent of Weed Seed.	Percent of Other Grass Seeds.	Percent of Inert Matter.	Percent of Germination.
30	Peas (Stratagem) ..... Holbrook Grocery Co., Keene, N. H. Feb. 5.	....	....	....	....	86.0
31	Peas (Black-eye Marrowfat) ..... Holbrook Grocery Co., Keene, N. H. Feb. 5.	....	....	....	....	91.5
32	Peas (Dwarf Champ. of England)..... Holbrook Grocery Co., Keene, N. H. Feb. 5.	....	....	....	....	77.5
33	Peas (Gradie's Tall)..... Holbrook Grocery Co., Keene, N. H. Feb. 5.	....	....	....	....	87.0
34	Redtop (Fancy, No. 2,403)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Feb. 11. Sorrel, 454; timo- thy, 3,178; yarrow, 9,534.	93.5	.3	.2	5.9	49.8
35	Corn (Sanford) ..... Holbrook Grocery Co., Keene, N. H. Feb. 5.	....	....	....	....	86.5
36	Millet (Japanese) ..... Maxfield & Sanborn, Pittsfield, N. H. Feb. 11. Charlock, 91; rag- weed, 454; smartweed, 454; yellow foxtail, 2,360.	97.7	.1	.0	.2	94.8
37	Red clover ..... Maxfield & Sanborn, Pittsfield, N. H. Feb. 11. Alsike clover, 1,907; docks, 91; green foxtail, 182; rib- grass, 454; timothy, 2,270; un- known, 273.	97.5	.2	.5	1.8	93.0
38	Timothy ..... Maxfield & Sanborn, Pittsfield, N. H. Feb. 11. Canada thistle, 226; crabgrass, 1,130; red clover, 908; redtop, 4,540.	98.3	trace	.2	1.5	90.3
39	Corn (Sanford, No. 9,251) ..... Holbrook Grocery Co., Keene, N. H. Feb. 5.	....	....	....	....	95.0
40	Red clover (Keystone "A")..... Shaw, Hammond & Carney, Port- land, Me. Feb. 18.	....	....	....	....	89.0
41	Alsike clover (Keystone "G")..... Shaw, Hammond & Carney, Port- land, Me. Feb. 18.	....	....	....	....	89.3
42	Alsike clover (Keystone "A")..... Shaw, Hammond & Carney, Port- land, Me. Feb. 18.	....	....	....	....	86.5
43	Timothy (Keystone "A")..... Shaw, Hammond & Carney, Port- land, Me. Feb. 18.	....	....	....	....	97.5
44	Timothy (Keystone "G")..... Shaw, Hammond & Carney, Port- land, Me. Feb. 18.	....	....	....	....	93.3
45	Timothy (Keystone "P. T.")..... Shaw, Hammond & Carney, Port- land, Me. Feb. 18.	....	....	....	....	92.0

SEED EXAMINATION, 1910.—*Continued.*

Sample No.	Kind of Seed, Sender, Date of Report, and Kind and No. of Foreign Seeds Found in One Pound.	Percent of Pure Seed.	Percent of Weed Seed.	Percent of Other Grass Seeds.	Percent of Inert Matter.	Percent of Germination.
46	Red clover (Keystone "G")..... Shaw, Hammond & Carney, Portland, Me. Feb. 18.	....	....	....	....	96.0
47	Redtop ..... Hilliard & Kimball, Exeter, N. H. Mar. 14. Oxeye daisy, 6,810.	93.9	trace	.0	5.9	71.3
48	Millet (Hungarian) ..... Hilliard & Kimball, Exeter, N. H. Mar. 14. Old witchgrass, 1,274; wild sunflower, 91; pigweed, 364; ragweed, 364; smartweed, 6,915; yellow foxtail, 2,648.	93.3	4.3	.0	2.3	89.0
49	Red clover ..... Hilliard & Kimball, Exeter, N. H. Mar. 14. Alsike clover, 1,910; docks, 273; green foxtail, 815; smartweed, 91; timothy, 635.	98.4	.3	.4	.8	94.3
50	Millet (Hungarian) ..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Mar. 15. Alsike clover, 4,900; barnyard grass, 91; Canada thistle, 180; green foxtail, 360; lamb's-quarters, 2,180; pigweed, 1,730; ragweed, 180; timothy, 180; yellow foxtail, 1,000.	97.3	1.2	.8	.6	90.3
51	Corn (Sanford, B 431)..... Holbrook Grocery Co., Keene, N. H. Mar. 7.	....	....	....	....	73.0
52	Peas (Premium Gem) ..... Holbrook Grocery Co., Keene, N. H. Mar. 9.	....	....	....	....	98.0
53	Peas (Nott's Excelsior) ..... Holbrook Grocery Co., Keene, N. H. Mar. 9.	....	....	....	....	92.0
54	Peas (Everbearing) ..... Holbrook Grocery Co., Keene, N. H. Mar. 9.	....	....	....	....	85.5
55	Peas (Tall English) ..... Holbrook Grocery Co., Keene, N. H. Mar. 9.	....	....	....	....	93.5
56	Peas (Alaska) ..... Holbrook Grocery Co., Keene, N. H. Mar. 9.	....	....	....	....	100.0
57	Peas (Yorkshire Hero) ..... Holbrook Grocery Co., Keene, N. H. Mar. 9.	....	....	....	....	80.5
58	Peas (American Wonder)..... Holbrook Grocery Co., Keene, N. H. Mar. 9.	....	....	....	....	95.5
59	Peas (Dwarf Champion)..... Holbrook Grocery Co., Keene, N. H. Mar. 9.	....	....	....	....	94.5
60	Beans (Long Yellow)..... Holbrook Grocery Co., Keene, N. H. Mar. 9.	....	....	....	....	99.5
61	Beans (Dwarf Hort.) ..... Holbrook Grocery Co., Keene, N. H. Mar. 9.	....	....	....	....	99.5

SEED EXAMINATION, 1910.—*Continued.*

Sample No.	Kind of Seed, Sender, Date of Report, and Kind and No. of Foreign Seeds Found in One Pound.	Percent of Pure Seed.	Percent of Weed Seed.	Percent of Other Grass Seeds.	Percent of Inert Matter.	Percent of Germination.
62	Peas (Sutton's Excelsior)..... Holbrook Grocery Co., Keene, N. H. Mar. 9.	....	....	....	....	83.0
63	Peas (Advancer) ..... Holbrook Grocery Co., Keene, N. H. Mar. 9.	....	....	....	....	78.0
64	Peas (Thos. Laxton)..... Holbrook Grocery Co., Keene, N. H. Mar. 15.	....	....	....	....	79.5
65	Peas (Gradie's) ..... Holbrook Grocery Co., Keene, N. H. Mar. 15.	....	....	....	....	70.5
66	Tall Nasturtium ..... Holbrook Grocery Co., Keene, N. H. Mar. 24.	....	....	....	....	60.0
67	Beans (Hort. Pole)..... Holbrook Grocery Co., Keene, N. H. Mar. 19.	....	....	....	....	90.0
68	Turnip Beet ..... Holbrook Grocery Co., Keene, N. H. Mar. 19.	....	....	....	....	132.0
69	Peas (Telephone) ..... Holbrook Grocery Co., Keene, N. H. Mar. 19.	....	....	....	....	79.0
70	Mangel-Wurtzel (Mammoth Long Red) Holbrook Grocery Co., Keene, N. H. Mar. 19.	....	....	....	....	169.0
71	Sweet Peas (Mixed)..... Holbrook Grocery Co., Keene, N. H. Mar. 24.	....	....	....	....	67.5
72	Dwarf Nasturtiums ..... Holbrook Grocery Co., Keene, N. H. Apr. 4.	....	....	....	....	72.0
73	Peas (Canada Field)..... Holbrook Grocery Co., Keene, N. H. Mar. 17.	....	....	....	....	92.0
74	White clover ("A. L.")..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Mar. 19. Alsike clover, 2,000; ribgrass, 2,270; selfheal, 1,135; sorrel, 35,866.	93.4	.5	.3	2.8	68.3
75	Alfalfa ("5'") ..... Whitney-Eckstein Seed Co., Buffalo, N. Y. Mar. 17. Docks, 91; green foxtail, 1,085; lamb's-quarters, 273; large-seeded dodder, 180; red clover, 91; ribgrass, 454; unknown, 180.	96.8	.6	trace	2.6	92.5
76	Timothy ..... Hilliard & Kimball, Exeter, N. H. Mar. 24. Cinquefoil, 681; lamb's- quarters, 227; peppergrass, 227; plaintain, 1,100.	99.6	.15	.0	.25	97.0
77	Redtop ..... W. H. Miller, New Durham, N. H. May 4. Cinquefoil, 180,000; plan- tain, 1,800; peppergrass, 900; timo- thy, 90,000.	77.4	2.0	12.0	8.6	68.0

SEED EXAMINATION, 1910.—*Continued.*

Sample No.	Kind of Seed, Sender, Date of Report, and Kind and No. of Foreign Seeds Found in One Pound.	Percent of Pure Seed.	Percent of Weed Seed.	Percent of Other Grass Seeds.	Percent of Inert Matter.	Percent of Germination.
78	Red clover (Northern)..... W. H. Miller, New Durham, N. H. May 4. Docks, 180; green foxtail, 90; plantain, 39,000; ribgrass, 720; timothy, 1,800; unknown, 180.	97.4	.7	.2	1.7	93.0
79	Millet (Hungarian) ..... W. H. Miller, New Durham, N. H. May 4. Green foxtail, 180.	99.5	trace	.0	.5	60.5
80	Timothy ..... W. H. Miller, New Durham, N. H. May 4. Alsike clover, 9,988; cin- quefoil, 227; mayweed, 227; plan- tain, 454; sorrel, 227; redtop, 1,362.	98.2	trace	1.5	.3	92.5
81	Corn (Native, No. 1)..... C. E. Treat, Fitzwilliam Depot, N. H. Apr. 4.	....	....	....	....	63.5
82	Corn (Commicks Early, No. 2)..... C. E. Treat, Fitzwilliam Depot, N. H. Apr. 4.	....	....	....	....	68.0
83	Red clover ..... Holbrook-Marshall Co., Nashua, N. H. Apr. 6. Alsike clover, 9,000; bracted plantain, 500; chickweed, 91; crabgrass, 900; docks, 630; green foxtail, 2,700; lamb's-quarters, 900; witchgrass, 5,600; plantain, 9,000; peppergrass, 91; pigweed, 180; rib- grass, 900; smartweed, 275; timo- thy, 72,000; yellow foxtail, 270.	80.6	4.0	7.6	7.8	63.5
84	Corn (Sanford) ..... Holbrook-Marshall Co., Nashua, N. H. Apr. 6.	....	....	....	....	93.0
85	Corn (Leaning) ..... Holbrook-Marshall Co., Nashua, N. H. Apr. 6.	....	....	....	....	92.0
86	Peas (Canada Field)..... Davison & Ward, Hanover, N. H. Mar. 25.	....	....	....	....	97.5
87	Peas (Improved Telephone)..... C. L. Jenness, Dover, N. H. Apr. 4.	....	....	....	....	70.5
88	Peas (Amer. Wonder) ..... C. L. Jenness, Dover, N. H. Apr. 4.	....	....	....	....	88.0
89	Peas (Everbearing)..... C. L. Jenness, Dover, N. H. Apr. 4.	....	....	....	....	86.0
90	Peas (Nott's Excelsior)..... C. L. Jenness, Dover, N. H. Apr. 4.	....	....	....	....	95.5
91	Sweet corn (Blk. Mexican)..... C. L. Jenness, Dover, N. H. Apr. 4.	....	....	....	....	84.0
92	Beans (Green Pod Stringless)..... C. L. Jenness, Dover, N. H. Apr. 4.	....	....	....	....	99.0
93	Sweet corn (Early Crosby) ..... C. L. Jenness, Dover, N. H. Apr. 4.	....	....	....	....	83.0
94	Sweet corn (Stowell's Evergreen)..... C. L. Jenness, Dover, N. H. Apr. 4.	....	....	....	....	87.0
95	Hubbard squash ..... C. L. Jenness, Dover, N. H. Apr. 4.	....	....	....	....	84.0
96	Muskmelon (Rocky-ford) ..... C. L. Jenness, Dover, N. H. Apr. 4.	....	....	....	....	53.0



SEED EXAMINATION, 1910.—*Continued.*

Sample No.	Kind of Seed, Sender, Date of Report, and Kind and No. of Foreign Seeds Found in One Pound.	Percent of Pure Seed.	Percent of Weed Seed.	Percent of Other Grass Seeds.	Percent of Inert Matter.	Percent of Germination.
97	Carrot (Danvers Half-long).....	....	....	....	....	67.0
	C. L. Jenness, Dover, N. H. Apr. 11.					
98	Spinach (Thick leaf).....	....	....	....	....	32.0
	C. L. Jenness, Dover, N. H. Apr. 11.					
99	Turnip (Purple top).....	....	....	....	....	92.0
	C. L. Jenness, Dover, N. H. Apr. 4.					
100	Cucumber (White Spine).....	....	....	....	....	80.5
	C. L. Jenness, Dover, N. H. Apr. 4.					
101	Cabbage (Warren's Stonemason).....	....	....	....	....	91.0
	C. L. Jenness, Dover, N. H. Apr. 4.					
102	Radish (Scarlet Turnip).....	....	....	....	....	90.5
	C. L. Jenness, Dover, N. H. Apr. 4.					
103	Onion (Danvers Yellow Globe).....	....	....	....	....	68.5
	C. L. Jenness, Dover, N. H. Apr. 11.					
104	Parsnip (Hollow crown).....	....	....	....	....	20.0
	C. L. Jenness, Dover, N. H. May 26.					
105	Lettuce (Boston Curled).....	....	....	....	....	51.0
	C. L. Jenness, Dover, N. H. Apr. 11.					
106	Turnip Beet (Dewings Early Blood)...	....	....	....	....	78.0
	C. L. Jenness, Dover, N. H. Apr. 14.					
107	Watermelon (Cole's Early).....	....	....	....	....	94.5
	C. L. Jenness, Dover, N. H. Apr. 11.					
108	Beans (Dwarf Hort.) .....	....	....	....	....	99.0
	C. L. Jenness, Dover, N. H. Apr. 4.					
109	Pumpkin (Sugar) .....	....	....	....	....	88.0
	C. L. Jenness, Dover, N. H. Apr. 11.					
110	Beans (Kidney Wax).....	....	....	....	....	91.5
	C. L. Jenness, Dover, N. H. Apr. 4.					
111	Beans (Bush Lima) .....	....	....	....	....	67.0
	C. L. Jenness, Dover, N. H. Apr. 11.					
112	Sweet Corn (Golden Bantam).....	....	....	....	....	89.0
	C. L. Jenness, Dover, N. H. Apr. 4.					
113	Timothy (No. 1) .....	99.5	.2	trace	.25	....
	Henry Evans & Co., Rochester, N. H. Apr. 1. Chickweed, 226; red clover, 226; miscellaneous, 678.					
114	Timothy (No. 2) .....	99.5	trace	.2	.3	....
	Henry Evans & Co., Rochester, N. H. Apr. 1. Mallow, 226; red clover, 678; redtop, 226.					
115	Oats .....	....	....	....	....	78.5
	Morris E. Henderson, Merrimack, N. H. Apr. 14.					
116	Millet (Barnyard) .....	93.5	6.4	.0	trace	88.5
	Thompson & Hoague Co., Concord, N. H. May 6. Ragweed, 1,550; smartweed, 180; yellow foxtail, 8,100; unknown, 360.					
117	Timothy .....	99.4	trace	.3	.3	75.5
	Thompson & Hoague Co., Concord, N. H. May 6. Peppergrass, 670; red clover, 2,043; redtop, 670; unknown, 227.					
118	Redtop .....	75.0	2.0	14.0	9.0	77.3
	Thompson & Hoague Co., Concord, N. H. May 6. Cinquefoil, 45,400; whitetop, 2,000; peppergrass, 1,500; timothy, 80,000.					

SEED EXAMINATION, 1910.—*Continued.*

Sample No.	Kind of Seed, Sender, Date of Report, and Kind and No. of Foreign Seeds Found in One Pound.	Percent of Pure Seed.	Percent of Weed Seed.	Percent of Other Grass Seeds.	Percent of Inert Matter.	Percent of Ger- mination.
119	Timothy ..... F. W. Clark, Wilton, N. H. Apr. 15.	....	....	....	....	80.0
120	Red clover ..... F. W. Clark, Wilton, N. H. Apr. 15.	....	....	....	....	90.3
121	Beans (Scarlet Runner) ..... J. B. Varick Co., Manchester, N. H. Apr. 25.	....	....	....	....	86.0
122	Beans (Long Yellow)..... J. B. Varick Co., Manchester, N. H. Apr. 25.	....	....	....	....	100.0
123	Beans (Black Ger. Wax)..... J. B. Varick Co., Manchester, N. H. Apr. 25.	....	....	....	....	66.5
124	Beans (Kidney Wax)..... J. B. Varick Co., Manchester, N. H. Apr. 25.	....	....	....	....	98.0
125	Beans (Golden Eye Wax)..... J. B. Varick Co., Manchester, N. H. Apr. 25.	....	....	....	....	98.0
126	Beans (Bush Lima)..... J. B. Varick Co., Manchester, N. H. Apr. 25.	....	....	....	....	88.0
127	Beans (Arlington) ..... J. B. Varick Co., Manchester, N. H. Apr. 25.	....	....	....	....	99.5
128	Beans (Dwarf Hort.)..... J. B. Varick Co., Manchester, N. H. Apr. 25.	....	....	....	....	96.5
129	Beans (Speckled Pole)..... J. B. Varick Co., Manchester, N. H. Apr. 25.	....	....	....	....	93.5
130	Beans (Imp. Golden Wax)..... J. B. Varick Co., Manchester, N. H. Apr. 25.	....	....	....	....	97.0
131	Beans (Ky. Wonder)..... J. B. Varick Co., Manchester, N. H. Apr. 25.	....	....	....	....	97.5
132	Beans (Yellow Eye)..... J. B. Varick Co., Manchester, N. H. Apr. 25.	....	....	....	....	98.0
133	Peas (Imp. Telephone)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	77.5
134	Peas (Imp. Stratagem)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	82.5
135	Beans (Rust Proof Blk. Wax)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	98.0
136	Sweet corn (Early Orange)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	97.0
137	Beans (Stringless Green Pod)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	84.5
138	Peas (Yorkshire Hero)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	64.5

SEED EXAMINATION, 1910.—*Continued.*

Sample No.	Kind of Seed, Sender, Date of Report, and Kind and No. of Foreign Seeds Found in One Pound.	Percent of Pure Seed.	Percent of Weed Seed.	Percent of Other Grass Seeds.	Percent of Inert Matter.	Percent of Ger- mination.
139	Peas (Nott's Excelsior)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	88.0
140	Peas (Amer. Wonder)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	96.0
141	Peas (Alaska) ..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	98.0
142	Peas (Gradie's) ..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	85.0
143	Peas (Sutton's Excelsior)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	95.5
144	Peas (First and Best)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	95.5
145	Peas (Canada Field)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	98.0
146	Peas (Thos. Laxton)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	89.5
147	Peas (Prem. Gem)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	89.5
148	Peas (Champ. of Eng.)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	76.0
149	Beans (White Lima)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	89.0
150	Peas (Dwarf Champ.)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	71.0
151	Peas (Black-eye Marrowfat)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	99.0
152	Peas (Bliss Everbearing)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	85.0
153	Peas (Advancer) ..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	93.0
154	Peas (Maud S.)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	98.5
155	Squash (Boston Marrow)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	67.0
156	Muskmelon (Yellow Cantaloupe)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	80.0
157	Cucumber (Long Green)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	76.5

EXAMINATION, 1910.—*Continued.*

Sample No.	Kind of Seed, Sender, Date of Report, and Kind and No. of Foreign Seeds Found in One Pound.	Percent of Pure Seed.	Percent of Weed Seed.	Percent of Other Grass Seeds.	Percent of Inert Matter.	Percent of Germination.
158	Cucumber (Imp. White Spine)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	91.0
159	Pumpkin (Conn. Field)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	84.0
160	Hubbard squash ..... J. B. Varick Co., Manchester, N. H. May 10.	....	....	....	....	93.5
161	Watermelon (Kolb's Gem)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	88.0
162	Radish (White Top)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	53.0
163	Radish (Scarlet Globe)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	90.5
164	Turnip (Yellow Rutabaga)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	98.0
165	Spinach (Summer) ..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	16.5
166	Celery (Giant Pascal)..... J. B. Varick Co., Manchester, N. H. May 31.	....	....	....	....	51.0
167	Carrot (Imp. Long Orange)..... J. B. Varick Co., Manchester, N. H. May 31.	....	....	....	....	53.5
168	Lettuce (Hanson) ..... J. B. Varick Co., Manchester, N. H. May 31.	....	....	....	....	10.0
169	Lettuce (Early Prize Head)..... J. B. Varick Co., Manchester, N. H. May 31.	....	....	....	....	47.0
170	Onion (Yellow Globe)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	73.0
171	Turnip (White Globe)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	71.0
172	Mangel Wurtzel (Giant)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	78.5
173	Beet (Detroit Dark Red)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	59.0
174	Cabbage (Early Jersey Wakefield).... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	54.5
175	Cabbage (Stonemason) ..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	69.5
176	White Mustard ..... J. B. Varick Co., Manchester, N. H. May 12.	....	....	....	....	90.5

SEED EXAMINATION, 1910.—*Continued.*

Sample No.	Kind of Seed, Sender, Date of Report, and Kind and No. of Foreign Seeds Found in One Pound.	Percent of Pure Seed.	Percent of Weed Seed.	Percent of Other Grass Seeds.	Percent of Inert Matter.	Percent of Germination.
177	Parsnip (Hollow Crown)..... J. B. Varick Co., Manchester, N. H. May 31.	....	....	....	....	47.0
178	Tomatoes (Dwarf Champ.)..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	52.0
179	Carrot (Ox-Heart) ..... J. B. Varick Co., Manchester, N. H. May 31.	....	....	....	....	55.0
180	Millet (German) ..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	84.0
181	Rape (Dwarf Essex) ..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	90.5
182	Barley (Six-Rowed) ..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	94.5
183	Barley (Two-Rowed) ..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	85.5
184	Spring Rye ..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	67.5
185	Buckwheat ..... J. B. Varick Co., Manchester, N. H. May 2.	....	....	....	....	87.5
186	Timothy (Pine Tree) ..... Holbrook Grocery Co., Keene, N. H. May 16. Alsike clover, 227; sorrel, 908.	99.6	.1	trace	.3	95.5
187	Timothy ..... Holbrook Grocery Co., Keene, N. H. May 16. Alsike clover, 681; black mustard, 454; cinquefoil, 1,135; plantain, 681; red clover, 227; red-top, 4,540.	98.8	.2	.3	.6	87.0
188	Oats (No. 1)..... L. W. Willard, Oxford, N. H. May 12. Green foxtail, 90; bindweed, 620; smartweed, 110; sorrel, 23; wheat, 90; barley, 46.	97.6	.9	.0	1.5	95.0
189	Oats (No. 2)..... L. W. Willard, Oxford, N. H. May 14. Bindweed, 23; wheat, 69; barley, 46.	99.2	.3	.0	.5	88.5
190	Timothy (No. 1)..... G. C. Craig, Rumney Depot, N. H. May 12. Old witchgrass, 227; ox-eye daisy, 227; pigweed, 454; sorrel, 1,130.	98.5	.2	trace	1.3	85.5
191	Timothy (No. 2)..... G. C. Craig, Rumney Depot, N. H. May 12. Sorrel, 227.	99.9	.1	.0	.0	94.3
192	Beans (Bush Cranberry)..... Meserve & Bowen, Franklin, N. H. May 9.	....	....	....	....	24.5



SEED EXAMINATION, 1910.—*Continued.*

Sample No.	Kind of Seed, Sender, Date of Report, and Kind and No. of Foreign Seeds Found in One Pound.	Percent of Pure Seed.	Percent of Weed Seed.	Percent of Other Grass Seeds.	Percent of Inert Matter.	Percent of Germination.
193	Sweet corn (Crosby's)..... Meserve & Bowen, Franklin, N. H. May 9.	.....	.....	.....	.....	87.5
194	Sweet corn (Golden Bantam)..... Meserve & Bowen, Franklin, N. H. May 9.	.....	.....	.....	.....	93.5
195	Corn (Sanford) ..... Meserve & Bowen, Franklin, N. H. May 9.	.....	.....	.....	.....	92.0
196	Corn (Stowell's Evergreen)..... Meserve & Bowen, Franklin, N. H. May 9.	.....	.....	.....	.....	87.5
197	Corn (White Cory's)..... Meserve & Bowen, Franklin, N. H. May 9.	.....	.....	.....	.....	92.0
198	Beans (Pole Cranberry)..... Meserve & Bowen, Franklin, N. H. May 9.	.....	.....	.....	.....	88.0
199	Peas (Alaska) ..... Meserve & Bowen, Franklin, N. H. May 9.	.....	.....	.....	.....	72.0
200	Peas (Champ. of Eng.)..... Meserve & Bowen, Franklin, N. H. May 12.	.....	.....	.....	.....	84.0
201	Peas (Blk. Eye Marrowfat)..... Meserve & Bowen, Franklin, N. H. May 12.	.....	.....	.....	.....	89.5
202	Beans (Blk. Wax)..... Meserve & Bowen, Franklin, N. H. May 9.	.....	.....	.....	.....	55.5
203	Peas (Carter's Telephone)..... Meserve & Bowen, Franklin, N. H. May 12.	.....	.....	.....	.....	50.0
204	Peas (Nott's Excelsior)..... Meserve & Bowen, Franklin, N. H. May 13.	.....	.....	.....	.....	86.5
205	Peas (Amer. Wonder)..... Meserve & Bowen, Franklin, N. H. May 13.	.....	.....	.....	.....	63.5
206	Beet (Breck's Dewing)..... Meserve & Bowen, Franklin, N. H. May 13.	.....	.....	.....	.....	75.5
207	White clover ..... J. B. Varick Co., Manchester, N. H. May 13.	.....	.....	.....	.....	66.3
208	Crimson clover ..... J. B. Varick Co., Manchester, N. H. May 13.	.....	.....	.....	.....	84.5
209	Alfalfa ..... J. B. Varick Co., Manchester, N. H. May 13.	.....	.....	.....	.....	88.3
210	Millet (Hungarian) ..... Rowe & Bartlett, Springville, Mo. May 17. Barnyard grass, 91; rag- weed, 91; red clover, 454; yellow foxtail, 728.	99.2	.4	.2	.1	80.5
211	Corn (Flint) ..... E. W. Lane, Hampton, N. H. May 5.	.....	.....	.....	.....	92.0

SEED EXAMINATION, 1910.—*Continued.*

Sample No.	Kind of Seed, Sender, Date of Report, and Kind and No. of Foreign Seeds Found in One Pound.	Percent of Pure Seed.	Percent of Weed Seed.	Percent of Other Grass Seeds.	Percent of Inert Matter.	Percent of Germination.
212	Oats ..... E. C. & W. L. Hopkins, Greenfield, N. H. May 9.	.....	.....	.....	.....	92.0
214	Alsike clover (Auburn, No. 31)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. May 13. Chickweed, 1,145; green foxtail, 454; old witchgrass, 227; red clover, 2,510; sorrel, 454; timothy, 22,600.	93.6	.4	4.5	1.5	92.5
215	Redtop (Unhulled)..... J. B. Varick Co., Manchester, N. H. May 31.	.....	.....	.....	.....	43.0
216	Orchard grass ..... J. B. Varick Co., Manchester, N. H. May 31.	.....	.....	.....	.....	54.0
217	R. I. Bent ..... J. B. Varick Co., Manchester, N. H. May 31.	.....	.....	.....	.....	74.0
218	Corn (Leaning) ..... C. M. Hildreth & Son, Lebanon, N. H. May 14.	.....	.....	.....	.....	90.0
219	Timothy ("Sun") ..... Holbrook Grocery Co., Keene, N. H. May 26. Alsike clover, 227.	99.9	.0	trace	.15	94.5
220	Timothy (C. F. P.)..... Holbrook Grocery Co., Keene, N. H. May 26. Plantain, 227.	99.4	trace	.0	.5	94.5
221	Corn (Sanford) ..... C. M. Hildreth & Son, Lebanon, N. H. May 26.	.....	.....	.....	.....	46.5
222	Peas (Bliss Everbearing) ..... R. H. Moore, Franklin, N. H. June 6.	.....	.....	.....	.....	80.0
223	Peas (Telephone)..... R. H. Moore, Franklin, N. H. June 6.	.....	.....	.....	.....	80.0
224	Peas (Early Alaska) ..... R. H. Moore, Franklin, N. H. June 6.	.....	.....	.....	.....	96.5
225	Peas (Nott's Excelsior)..... R. H. Moore, Franklin, N. H. June 6.	.....	.....	.....	.....	91.5
226	Peas (Gradie's) ..... R. H. Moore, Franklin, N. H. June 6.	.....	.....	.....	.....	72.0
227	Beans (Early Golden Wax) ..... R. H. Moore, Franklin, N. H. June 6.	.....	.....	.....	.....	97.0
228	Corn (Early Red Cory)..... R. H. Moore, Franklin, N. H. June 6.	.....	.....	.....	.....	91.5
229	Corn (Country Gentleman)..... R. H. Moore, Franklin, N. H. June 6.	.....	.....	.....	.....	97.0
230	Beans (Mammoth Green Pod)..... R. H. Moore, Franklin, N. H. June 6.	.....	.....	.....	.....	98.5
231	Peas (Amer. Wonder)..... R. H. Moore, Franklin, N. H. June 6.	.....	.....	.....	.....	86.5
232	Sweet corn (Golden Bantam)..... R. H. Moore, Franklin, N. H. June 6.	.....	.....	.....	.....	94.0
233	Corn (Early White Cory)..... R. H. Moore, Franklin, N. H. June 6.	.....	.....	.....	.....	86.5
234	Corn (Stowell's Evergreen)..... R. H. Moore, Franklin, N. H. June 6.	.....	.....	.....	.....	85.5
235	Beans (Dwarf Blk. Wax)..... R. H. Moore, Franklin, N. H. June 6.	.....	.....	.....	.....	96.5

SEED EXAMINATION, 1910.—*Continued.*

Sample No.	Kind of Seed, Sender, Date of Report, and Kind and No. of Foreign Seeds Found in One Pound.	Percent of Pure Seed.	Percent of Weed Seed.	Percent of Other Grass Seeds.	Percent of Inert Matter.	Percent of Ger- mination.
236	Beans (Dwarf Hort.)..... R. H. Moore, Franklin, N. H. June 6.	....	....	....	....	96.5
237	Corn (White Ensilage)..... Spaulding & Slade, Walpole, N. H. June 25.	....	....	....	....	75.0
238	Timothy (No. 678)..... Whitney-Eckstein Seed Co., Buffalo, N. Y. June 28. Alsike clover, 227; sorrel, 454.	99.6	trace	trace	.3	94.0

SUMMARY TABLE, SHOWING THE KINDS OF FOREIGN SEEDS  
FOUND IN SAMPLES EXAMINED IN 1910, AND THE NUM-  
BER OF SAMPLES IN WHICH THEY WERE FOUND.

NAMES OF FOREIGN SEEDS.	Names of Samples Examined.							
	Red Clover.	Alsike Clover.	White Clover.	Alfalfa.	Timothy.	Redtop.	Millet.	Oats.
Number of Samples Examined.	8	4	2	2	17	8	10	2
Alsike clover.....	6	..	2	..	7	1	1	..
Barley .....	..	..	..	..	..	..	..	2
Barnyard grass.....	..	..	..	..	..	..	2	..
Bindweed .....	..	..	..	..	..	..	..	2
Black mustard .....	..	..	..	..	1	..	..	..
Bracted plantain .....	1	..	..	..	..	..	..	..
Canada bluegrass .....	..	1	..	..	1	..	..	..
Canada thistle .....	..	..	..	..	1	..	1	..
Charlock .....	..	..	..	..	..	..	2	..
Chicory .....	..	..	..	1	..	..	..	..
Chickweed .....	1	1	1	..	1	..	..	..
Cinquefoil .....	..	..	..	..	3	4	..	..
Crab-grass .....	1	..	..	..	1	..	2	..
Docks .....	4	1	..	1	..	..	..	..
Dodder .....	..	..	..	1	..	..	..	..
Green fox-tail .....	5	1	..	1	..	..	2	1
Kentucky bluegrass .....	1	..	..	..	..	..	..	..
Lady's thumb .....	..	..	..	..	..	..	1	..
Lamb's-quarters .....	1	..	..	1	1	..	2	..
Mallow .....	..	..	..	..	1	..	..	..
May weed .....	..	..	..	..	1	..	..	..
Miscellaneous or unknown.....	3	..	..	1	2	..	1	..
Mouse-eared chickweed .....	..	..	..	..	..	1	..	..
Ox-eye daisy .....	..	..	..	..	1	1	..	..
Peppergrass .....	1	..	..	..	3	2	..	..
Pig-weed .....	1	..	..	..	1	..	3	..
Plantain .....	2	..	..	..	5	1	..	..
Purslane .....	..	..	..	..	1	..	..	..
Rag-weed .....	1	..	..	..	..	6	..	..
Red clover .....	..	2	..	1	6	1	..	..
Redtop .....	..	1	..	..	6	..	..	..
Rib-grass .....	3	1	2	2	..	..	..	..
Selfheal .....	..	..	1	..	..	..	..	..
Smartweed .....	3	..	1	..	..	..	6	1
Sorrel .....	2	3	2	..	6	1	..	1
Spiny sida .....	..	..	..	..	..	..	1	..
Timothy .....	6	4	..	..	..	7	2	..
Wheat .....	..	..	..	..	..	..	..	2
Whitetop .....	..	..	..	..	..	1	..	..
Wild Sunflower .....	..	..	..	1	..	..	..	..
Witch grass .....	..	1	..	..	1	..	2	..
Yarrow .....	..	..	..	..	..	2	..	..
Yellow fox-tail .....	3	..	..	..	..	..	8	..
Yellow trefoil .....	..	..	..	1	..	..	..	..





Radish	3	.....	3	.....	.....	.....	.....	.....	90.5	58.0	79.7	93.
Rape	1	.....	1	.....	.....	.....	.....	.....	90.5	.....	.....	93.
R. I. Bent	1	.....	1	.....	.....	.....	.....	.....	74.0	.....	.....	78.
Red clover	11	8	11	99.7	80.6	96.4	98.	1.8	1.7	63.5	87.2	88.
Redtop	9	8	9	95.0	75.0	85.7	95.	5.8	7.1	43.0	58.1	78.
Rye	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	93.
Spinach	2	.....	2	.....	.....	.....	.....	.....	67.5	.....	.....	88.
Squash	3	.....	3	.....	.....	.....	.....	.....	32.0	16.5	24.3	88.
Tomatoes	21	17	20	99.9	98.2	99.3	98.	.2	.5	67.0	81.5	88.
Turnips	1	.....	1	.....	.....	.....	.....	.....	.....	75.5	91.8	88.
Turnip	3	.....	3	.....	.....	.....	.....	.....	52.0	.....	.....	88.
White clover	3	2	3	95.3	93.4	94.4	95.	3.4	2.3	71.0	87.0	93.
Total	238	53	237	.....	.....	.....	.....	1.7	88.0	66.3	74.2	78.

From the last table it may be noted that the average timothy seed on our market during the year was above the standard as regards both purity and germination; the redtop was below as to purity and considerably below as to germination; the average of the clovers was slightly below the standard as to both purity and germination, one sample of red clover having as low as 80.6% pure seed and a germination of only 63.5%; the millets were likewise a little below the standards, one sample showing only 60.5% germination; only two samples of alfalfa were examined for purity, and one of these contained dodder.

The average germination of the field corn was 10% below the standard, one sample showing only 46.5%; this low average was due to the general poor season for corn in 1909, and the consequent difficulty of securing first-class seed. The average of the sweet corn was practically up to the standard, although one sample showed as low as 68%. The average germination of both beans and peas was below the standard, although samples of each tested as high as 100%, and as low as 24.5% for beans and 20% for peas. Two samples of oats were tested for purity, in one of which considerable quantities of weed seed were found.

#### THE TEXT OF THE LAW.

HOUSE BILL . . . . . NO. 396.

#### STATE OF NEW HAMPSHIRE.

IN THE YEAR OF OUR LORD ONE THOUSAND NINE HUNDRED  
AND NINE.

#### AN ACT

To Regulate the Sale of Agricultural Seeds.

*Be it enacted by the Senate and House of Representatives in  
General Court convened:*

SECTION 1. Every lot of agricultural seeds, including the seeds of cereals, grasses, forage plants, vegetables, garden

plants and white pine trees, but not including those of other trees, shrubs, and ornamental plants, which is sold, offered or exposed for sale for seed in bulk or package of one pound or more, within this state shall be accompanied by a plainly written or printed guarantee, stating first, its percentage of purity from foreign seeds and other matter, and, second, its percentage of vitality.

SECT. 2. Sellers or dealers in seeds may base their guarantees upon tests or analyses conducted by themselves, their agents, or by the secretary of the State Board of Agriculture or his agents *provided* that such tests or analyses shall be made in such a manner and under such conditions as the said secretary may prescribe.

SECT. 3. The results of all tests or analyses of seeds made by the said secretary, together with the names and addresses of the persons from whom the samples of seed were obtained, shall be published annually in a bulletin by the New Hampshire College Experiment Station, and biennially in the report of the State Board of Agriculture. The said secretary shall also publish from time to time in the Quarterly Report of the State Board of Agriculture equitable standards of purity and vitality, together with such information concerning agricultural seeds as may be of public benefit.

SECT. 4. Whoever sells, offers, or exposes for sale or for distribution, within this state, any agricultural seeds heretofore named in this act, without complying with the requirements of sections one and two, or whoever, with intention to deceive, wrongly marks or labels any lot of agricultural seeds, including the seeds of cereals, grasses, forage plants, vegetables, garden plants and white pine trees, but not including those of other trees, shrubs, and ornamental plants, as pertains to their percentage of purity and vitality, shall be punished by a fine not exceeding one hundred dollars for the first offense, and not exceeding two hundred dollars for each subsequent offense.

SECT. 5. The provisions of the four preceding sections

shall not apply to any person growing, selling, offering or exposing for sale cereals and other agricultural seeds for food.

SECT. 6. The secretary of the State Board of Agriculture shall diligently enforce the provisions of sections one and four of this act, and in his discretion prosecute offenses against the same.

#### THE OBJECT OF THE LAW.

The object of this law is in substance the same as that of our pure food and fertilizer laws, namely, to have the buyer know just what he is buying. It is intended to provide a means whereby our farmers and other purchasers of seeds may have reliable information, on the basis of which they may protect themselves against the introduction of noxious weeds and against loss through weak or otherwise worthless seeds; also to provide a reasonable protection for careful, conscientious dealers against negligent, designing or unscrupulous ones.

It is not the purpose or intent of the law to work a hardship on our seed dealers or to hurt their legitimate business, and neither is it intended to require farmers and other growers to purchase seeds of a better quality than they desire.

#### STANDARDS.

The law does not attempt to fix any standards as to purity and vitality, but for the information of those who may desire to know what may be considered as "equitable standards" the following table, offered by the U. S. Department of Agriculture, and based upon investigations made by that department, is given.

## STANDARDS OF PURITY AND GERMINATION OF AGRICULTURAL SEEDS.

Seed	Purity percent	Germination percent	Seed	Purity percent	Germination percent
Alfalfa,	98	85—90	Lettuce,	99	85—90
Asparagus,	99	80—85	Kafir corn,	98	85—90
Barley,	99	90—95	Melon,	99	85—90
Beans,	99	90—95	Milletts,	99	85—90
Beets,	99	*150	Mustard,	99	90—95
Blue grass,			Oats,	99	90—95
Canadian,	90	45—50	Okra,	99	80—85
Blue grass,			Onion,	99	80—85
Kentucky,	90	45—50	Parsley,	99	70—75
Brome, awnless,	90	75—80	Parsnip,	95	70—75
Buckwheat,	99	90—95	Peas,	99	93—98
Cabbage,	99	90—95	Pumpkins,	99	85—90
Carrot,	95	80—85	Radish,	99	90—95
Cauliflower,	99	80—85	Rape,	99	90—95
Celery,	98	60—65	Redtop,	95	75—80
Clover, alsike,	95	75—80	Rye,	99	90—95
Clover, crimson,	98	85—90	Salsify,	98	75—80
Clover, red,	98	85—90	Sorghum,	98	85—90
Clover, white,	95	75—80	Spinach,	99	80—95
Collard,	99	90—95	Spurry,	99	85—90
Corn, field or			Squash,	99	85—90
ensilage,	99	90—95	Timothy,	98	85—90
Corn, sweet,	99	85—90	Tomato,	98	85—90
Cowpea,	99	85—90	Turnip,	99	90—95
Cucumber,	99	85—90	Tobacco,	98	75—80
Eggplant,	99	75—80	Wheat,	99	90—95
Fescue,					
meadow,	95	85—90			

The term "percentage of vitality," as used in the law, will be interpreted to mean the percentage of germination, or the number of seeds in one hundred which show their vitality by germinating under laboratory test conditions.

\* Each beet fruit or "ball" is likely to contain from 2 to 7 seeds. One hundred balls should yield at least 150 sprouts.



It should be kept in mind that any fixed standard below that which is possible to be attained would be undesirable both for the seedsman and the farmer. Dealers should recognize this fact and aim to handle only the best seeds that can be obtained, and thus gain for themselves a reputation and profit for as high standards of quality and purity as may be reasonably attained. Many conditions affect the vitality of seeds,—the products of certain seasons being unavoidably poor. Many difficulties also attend the separation of certain varieties of farm and garden seeds from certain common weeds seeds, and impurities are the result. Seedsmen and farmers, alike, should recognize these facts. But whether the seeds are good or bad, we must know *how* good or bad they are.

#### LABELING.

The law does not apply to the common five and ten-cent packages of garden and flower seeds. Only seeds sold in bulk or in packages of one pound or more are subject to the provisions of the law and are required to be accompanied by a guarantee stating their percentage of purity and vitality.

The guarantee or label may be of any form desired by the seller of the seeds as a tag, sticker, or direct brand upon the container. It must, however, be plainly written or printed, and placed distinctly visible to the purchaser. Each dealer will provide his own labels.

#### TESTS AND EXAMINATIONS.

Section two of the law states the provisions under which the tests and analyses shall be made. The secretary of the State Board of Agriculture has appointed F. W. Taylor, agronomist of the experiment station, as his regular agent for making all tests and analyses in this state. The sellers or dealers who desire to base their guarantees upon tests made by themselves or their agents must first secure the approval by the secretary of the State Board of Agriculture of the methods to be used in making the tests, and of the person who is to conduct them.

## TAKING OF SAMPLES.

To secure a fair average sample of a lot or bulk, take small quantities from all of the bags or from different parts of any particular bulk. Mix thoroughly and take out the sample to be inspected. When the seeds are in bags or large bins, the use of a grain sampler is most convenient, since this will insure getting seeds from the top, middle, and bottom alike. Since the report of the analysis is based upon the nature of the sample inspected, it is important that the sample be carefully taken.

## SIZE AND AMOUNT OF SAMPLES.

The size and amount of the samples necessary for a test will depend upon the size and weight of the seeds: about one half ounce, or a tablespoonful of the smaller grass and vegetable seeds like alsike and white clover, redtop, lettuce, onions, radish, turnip, etc.; about one ounce or two tablespoonfuls of the larger seeds, like timothy, millet, red clover, alfalfa, rape, etc.; and about four ounces or a small cupful of the cereal grains or vegetable seeds, like oats, barley, corn, peas, beans, etc., should be sent.

## SENDING OF SAMPLES.

Samples sent to the experiment station for testing should be enclosed in a strong paper envelope and securely fastened. Single samples should be sent by mail at the customary merchandise rates. When a number of samples are to be sent they should be put up securely in a single package and forwarded by mail or express, whichever way is the cheaper. Samples should not be sent in bottles or glass jars. Each sample sent in should be marked as follows:

Name and address of sender:

Date of sending:

Kind of seed:

Brand name (if any), and number of package:

Purity or germination test desired (one or both):

Write a letter stating the number and kind of samples sent so that their receipt may be promptly acknowledged.

Address all samples and communications regarding the same to F. W. Taylor, Experiment Station, Durham, N. H.

#### REPORTING RESULTS OF TESTS.

Reports upon the purity of samples can usually be furnished within two or three days after they are received. Final reports upon germination tests or upon different examinations as to purity will vary as to time, according to the number of samples on hand, amount of impurities, variety of seeds, etc. The following list shows the usual time required for final germination reports upon the more common seeds:

Alfalfa, alsike, and other clovers, beans, peas, corn, cucumbers, cabbage, millet, rape, turnips, oats, and other cereals, five to seven days.

Beets, buckwheat, timothy, tomatoes, melons, and vetch, six to nine days.

Brome grass, fescues, salsify, and spinach, eight to twelve days.

Carrots, celery, parsnips, orchard grass, redtop and tobacco, ten to fifteen days.

Blue grass, fifteen to thirty days.

It is hoped that all will recognize that there are many others sending in seeds for examination who wish "immediate replies." All samples will be examined in the order of their receipt. Reports by telephone or telegraph will be given at the expense of the sender of the sample.

#### KINDS OF IMPURITIES.

In making reports of tests all seeds other than those of the variety under examination found in a sample will be considered as foreign seeds and therefore as impurities. Dirt, stems, hulls, sand, etc., will also constitute an impurity under the term "inert matter." While other kinds of grass seed found in a given sample constitute an impurity, their

presence there may not be harmful or even objectionable. In view of this fact, the reports of inspection will have the total percentage of impurity divided into percentage of inert matter, percentage of other grass seeds and percentage of weed seeds. For example, if a sample of timothy is found to be ninety-five percent pure and the five percent of impurity to be alsike clover and redtop, both the seller and the buyer ought to know it.

#### EXPENSES OF TESTS AND ANALYSES.

As no funds are available for the secretary of the state board or for the experiment station to conduct the tests, a nominal charge, sufficient to cover the cost of making them, must be made. The charge for making a purity test will be 75 cents per sample. For seeds sold in mixtures the charge will be 75 cents for the sample and ten cents additional for each kind of seed said to be contained therein. The charge for making a germination test will be 25 cents per sample. Seeds will be tested for any resident of the state, whether a dealer or not, at the above rates.

#### METHODS OF EXAMINATION AND TESTING.

For purity tests the regulations offered in Circular No. 34 of the Office of Experiment Stations are followed with only minor variations. A portion of the original sample is filed away in a properly numbered, heavy manila envelope for future use or for a retest if one is demanded. A smaller envelope which contains the pure seed obtained upon separation is also filed within the larger one. An ordinary card index file with five by eight drawers, divided, is used for this purpose.

The germinating chamber is a "home-made" affair, two and one third by two and one half by five feet over all. It contains twenty-two shelves two feet square. The shelves are made of quarter-inch mesh galvanized wire netting, bound on the edges with galvanized iron. The temperature and humidity is maintained by means of water contained in

a copper cylinder, twelve inches in diameter and ten inches deep, suspended from the bottom of the chamber. The water is kept at the proper temperature by either a gas flame or an electric bulb placed underneath and controlled by a thermostat. The seeds are placed in folds of blotting paper on the trays, the latter being both removable and interchangeable.

The records of all tests and examinations are kept in a specially designed book, a duplicate of the original being detached and forwarded as the official report to the sender of the sample. The form of the record kept, a view of the germinating chamber, a corner of the seed testing room, and the style of the envelope used for filing may be noted from the illustrations.



REPORT  
OF  
CATTLE COMMISSIONERS  
1909 - 1910.



## BOARD OF CATTLE COMMISSIONERS.

---

IRVING A. WATSON, President.....Concord.  
NAHUM J. BACHELDER, Secretary.....Concord.  
RICHARD PATTEE .....Plymouth.

### ADVISORY BOARD.

#### STATE BOARD OF HEALTH.

HENRY B. QUINBY.....Laconia.  
GRANVILLE P. CONN.....Concord.  
EDWIN G. EASTMAN.....Exeter.  
IRVING A. WATSON.....Concord.  
ROBERT FLETCHER .....Hanover.  
CHARLES S. COLLINS.....Nashua.

#### STATE BOARD OF AGRICULTURE.

HENRY B. QUINBY.....Laconia.  
JOSEPH D. ROBERTS.....Rollinsford.  
ALDEN F. SANBORN.....Fremont.  
THADDEUS W. BARKER.....Nelson.  
DANIEL C. WESTGATE.....Plainfield.  
EDWARD E. BISHOP.....Bethlehem.  
GEORGE H. WADLEIGH.....Tilton.  
S. O. HUCKINS.....Ossipee.  
HERBERT O. HADLEY.....Peterborough  
MILES W. GERY.....Colebrook.  
F. HALE FLANDERS.....Andover.

## EXECUTIVE COMMITTEE STATE GRANGE.

RICHARD PATTEE .....	Plymouth.
ALBERT J. RICHARDSON.....	Littleton.
CHARLES W. BARKER.....	Exeter.
WILLIAM A. COWLEY.....	East Concord
GEORGE R. DRAKE.....	Manchester.

## VETERINARIANS.

WILLIAM T. RUSSELL.....	Nashua.
ROBERT J. MACGUIRE.....	Concord.
GEORGE G. MACGREGOR.....	Whitefield.
F. V. BARRETT.....	Peterborough.
LEMUEL POPE, JR.....	Portsmouth.
GEORGE W. COPP.....	Tuftonborough.
WALTER B. LORING.....	Milford.
G. E. CHESLEY.....	Rochester.
R. F. MOORE.....	Lakeport.
F. L. BODWELL.....	Dover.
J. L. RATHBONE.....	Brattleboro, Vt.
C. E. BURCHSTED.....	Concord.

# REPORT.

---

*To His Excellency the Governor and to the Honorable Council:*

The report of the State Board of Cattle Commissioners from September 1, 1908, to September 1, 1910, is herewith presented:

It contains the public statutes under which the work of the board has been carried out, the orders and regulations issued by the board, an account of the foot-and-mouth disease, the record of inspections made, number of diseased animals destroyed, financial statement, recommendations, etc.

## CHAPTER 113, PUBLIC STATUTES.

### UNITED STATES INSPECTORS.

SECTION 1. The governor is authorized to accept on behalf of the state the rules and regulations prepared by the commissioner of agriculture under and in pursuance of section three of an act of congress approved May 29, 1884, entitled, "An act for the establishment of a bureau of animal industry, to prevent the exportation of diseased cattle, and to provide means for the suppression and extirpation of pleuro-pneumonia and other contagious diseases among domestic animals," and to co-operate with the authorities of the United States in the enforcement of the provisions of such act.

SECT. 2. The inspectors of the bureau of animal industry of the United States shall have the right of inspection, quarantine, and condemnation of animals affected with any



contagious, infectious, or communicable disease, or suspected of being so affected, or that have been exposed to any such disease; and for these purposes are authorized and empowered to enter upon any ground or premises. They shall have power to call on sheriffs, constables, and peace officers to assist them in the discharge of their duties in carrying out the provisions of said act of congress; and it is made the duty of said officers to assist them when so requested. The inspectors shall have the same powers and protection as peace officers while engaged in the discharge of their duties.

SECT. 3. All damages and expenses incurred under the preceding sections shall be paid by the United States, and in no case shall this state be liable for any part thereof.

#### STATE BOARD OF CATTLE COMMISSIONERS.

SECT. 4. The secretary of the State Board of Agriculture, the master of the New Hampshire State Grange of the Patrons of Husbandry, and the secretary of the State Board of Health, for the time being, shall constitute a board, to be known as the State Board of Cattle Commissioners. If a vacancy in the board shall occur, the governor, with the advice of the council, shall fill it by appointment, and the appointee shall hold office until the vacancy in the office occasioning the vacancy in the board is filled.

SECT. 5. The board shall make investigations in regard to the existence of contagious and infectious diseases among domestic animals within the state, and may make regulations prohibiting the introduction into the state of animals so diseased, and controlling or prohibiting their transportation, and such other regulations as the board deems necessary to exclude or arrest any such disease, and may modify or amend its regulations as the circumstances shall require.

SECT. 6. The board may employ skilled veterinarians and agents and servants to aid in the performance of the duties assigned to the board.

SECT. 7. Any person or corporation who shall violate any of the regulations of the board shall be fined not exceeding one hundred dollars.

SECT. 8. The compensation and expenses of the board shall be audited and fixed by the governor and council, and shall be paid from the state treasury, but all expenses incurred under the provisions of this chapter shall not exceed ten thousand dollars in any one year.

#### CARE AND DISPOSITION OF DISEASED ANIMALS.

SECT. 9. Selectmen shall cause all horses infected with glanders or other contagious disease, and all other domestic animals infected with contagious diseases, or which have been exposed to such diseases, to be collected in some suitable place or places and kept isolated from other animals so long as may be necessary to prevent the spread of the diseases.

SECT. 10. In the performance of the duties prescribed by the preceding section, the selectmen shall be governed by the regulations and directions that may be made or given on the subject by the State Board of Cattle Commissioners.

SECT. 11. The State Board of Cattle Commissioners, or, if they have not taken cognizance of the case, the selectmen of the town in which the animal is, may order any domestic animal to be killed and buried, which, in the opinion of a veterinary surgeon selected by them, has a contagious or infectious disease.

SECT. 12. The owners of animals so killed shall be entitled to recover of the town the value of such animals in their diseased condition, if they have been owned in the state three months at least before the disease was detected. The State Board of Cattle Commissioners or the selectmen, as the case may be, shall cause the value to be ascertained by the appraisal of three competent and disinterested persons selected by them, who shall be sworn to the faithful discharge of their duties.

SECT. 13. In case the owner is aggrieved by the appraisal, he may appeal by petition to the supreme court within thirty days after he is notified of the appraisal. He shall notify the

town of his appeal, and enter and prosecute it as he would if it were a civil action at law wherein the same amount of damages was claimed, and judgment shall be rendered therein in like manner.

SECT. 14. If upon such appeal he recovers a larger sum than the appraisers awarded him, he shall recover his taxable costs; otherwise he shall pay costs.

SECT. 15. All damages and expenses incurred under the six preceding sections, except expenses incurred by the State Board of Cattle Commissioners, shall be paid by the town in the first instance; but four fifths thereof shall be reimbursed to it from the state treasury. The governor and council shall audit all claims thus presented and the governor shall draw his warrants upon the treasurer for the amounts allowed in favor of the towns entitled thereto.

#### PRECEDENCE IN AUTHORITY.

SECT. 16. In cases where United States inspectors, state commissioners and selectmen, or any two of such boards, take action with reference to the same subject matter under the provisions of this chapter, they shall have precedence in authority in the order above named.

#### PENALTIES IN CERTAIN CASES.

SECT. 17. Any person or corporation who shall bring into the state between the twentieth day of May and the twentieth day of October any Texas or Cherokee cattle that have not been kept north of the Ohio or Missouri river during the winter immediately preceding, shall be fined not exceeding twenty-five dollars for each animal so brought into the state. The term Texas or Cherokee cattle shall be construed to mean the native cattle of Texas and Louisiana and the classes of cattle known under those names.

SECT. 18. Any person who shall expose, or suffer to be exposed, in any highway, public place, or pasture, any horse affected by the disease known as glanders, shall be fined not exceeding fifty dollars for each offense, for the benefit of the town or city where the offense is committed.

SECT. 19. Any person exposing any domestic animal as aforesaid, affected with any other contagious or troublesome disease, shall be fined not exceeding twenty-five dollars for each offense for the benefit of the town.

SECT. 20. It shall be the duty of selectmen and police officers of towns in which any of the offenses mentioned in the three preceding sections shall be committed, to cause the offenders to be prosecuted.

#### AMENDMENT of 1893.

At the session of the legislature of 1893 the following amendment was passed:

SECTION 1. The owners of cattle killed by order of the State Board of Cattle Commissioners shall recover of the state one half the value of such animals upon a basis of health, said value to be ascertained by a disinterested appraisal, provided they have been owned in the state three months at least before the disease was detected.

SECT. 2. All acts and parts of acts inconsistent with this act are hereby repealed, and this act shall take effect upon its passage.

### QUARANTINE REGULATIONS IN FORCE,

#### STATE OF NEW HAMPSHIRE.

#### BOARD OF CATTLE COMMISSIONERS.

CONCORD, July 14, 1896.

#### GENERAL ORDER NO. 3.

1st. General Order dated January 11, 1892, and General Order dated January 19, 1892, are hereby repealed.

2d. All persons and companies are hereby prohibited from bringing or driving neat cattle into the state of New Hampshire without a permit from this board.

3d. All neat cattle brought or driven into the state of New Hampshire under a permit from this board are hereby

placed in quarantine upon arrival in the state until identified and released.

4th. Selectmen of towns and cities of New Hampshire are hereby authorized to seize and hold in quarantine any neat cattle coming into the state without a legal permit, and notify this board at once of such action.

5th. Permits to bring or drive neat cattle into New Hampshire will be issued only upon the result of the tuberculin test, to be applied and reported under such regulations and forms as will be furnished upon application to this board.

6th. This order is issued under authority of chapter 113 of the Public Statutes of New Hampshire, and all violations will be vigorously prosecuted.

7th. This order shall take effect on the fifteenth day of July, 1896.

IRVING A. WATSON,

*President Board of Cattle Commissioners.*

N. J. BACHELDER,

*Secretary Board of Cattle Commissioners.*

The following explanatory circular was issued in connection with the above order:

STATE OF NEW HAMPSHIRE.

BOARD OF CATTLE COMMISSIONERS.

*To Whom It May Concern:*

The quarantine regulations issued by the Board of Cattle Commissioners of the state of New Hampshire against all cattle outside of the state are made necessary by the action already taken in the same line by the authorities of other New England states. Evidence has been submitted to this board that animals failing to pass the test and therefore debarred from those states are being brought into New Hampshire and are contributing to our milk supply to the injury of the healthfulness and reputation of New Hampshire dairy products.



Persons desiring to bring cattle into New Hampshire will be furnished upon application with the necessary blanks upon which to forward the result of the test, said test to be made by any person who is satisfactory to the cattle commissioners of the state in which such test is made. Upon arrival in this state the cattle will be identified and released as soon as practicable by this board or its representative.

In making this report of the tuberculin test, when applying for a permit, both the original and duplicate reports are to be made out and forwarded to this office without being detached from the blank permit.

## BOARD OF CATTLE COMMISSIONERS,

Concord, N. H.

### MODIFICATION OF QUARANTINE ORDER.

STATE OF NEW HAMPSHIRE.

BOARD OF CATTLE COMMISSIONERS.

GENERAL ORDER NO. 4.

General Order No. 3, dated July 14, 1896, is hereby modified as follows:

On and after this date unless otherwise ordered, neat stock will be admitted to the state of New Hampshire for pasturage or for domestic use under the following conditions:

1. Applications for permit to bring cattle into New Hampshire for pasturage or for domestic use must be made upon blanks furnished by this board.

2. The owner or drover of said cattle must state upon said application that they are brought into the state for pasturage, or for domestic use.

3. The owner or drover of said cattle must furnish upon said application the certificate of a veterinarian who is a regular graduate of a veterinary institution or who is recommended by the cattle commissioners of the state from which the cattle are sent stating that the cattle have been

subjected to a physical examination, and no symptoms of tuberculosis or other contagious disease are found.

4. Applications from Massachusetts must also state that the cattle have been tagged by the Massachusetts Cattle Commission, which will entitle them to return to that state without reëxamination, and must be indorsed in this respect by the Massachusetts Cattle Commission, or an agent of said commission.

5. This order will take effect April 1, 1897, and remain in force until revoked by this board.

N. J. BACHELDER,

*Secretary New Hampshire Board of Cattle Commissioners.*

The following explanatory circular was issued in connection with the modification order:

STATE OF NEW HAMPSHIRE.

OFFICE OF THE STATE BOARD OF CATTLE COMMISSIONERS.

*To Owners and Drovers of Stock:*

The inclosed order modifies the previously existing regulation in regard to bringing neat stock into New Hampshire for pasturage, inasmuch as it allows a physical examination instead of requiring the tuberculin test. The application for permit must be made to the board upon the application furnished by this board and no neat cattle can be legally admitted for pasturage until said application has been properly filled out and filed with this board, and the permit issued in due and regular form. In short, this order simply allows the report of the physical examination to be filed with this board instead of the report of the tuberculin test, and a permit to bring cattle into New Hampshire for pasturage or other purposes is just as necessary as before the issuing of this order.

Selectmen and other officials have full authority to proceed against violators of this and the previous order as modified, the same as before, and all parties will govern themselves accordingly.

N. J. BACHELDER,

*Secretary New Hampshire Board of Cattle Commissioners.*

While the law enacted to govern this matter confers upon the executive officer of the State Board of Health, the State Board of Agriculture, and State Grange, the authority in the suppression of contagious diseases among domestic animals, yet all action taken and money expended has been with the approval of the executive officer of the several organizations named and by the advice of the governor and council. Every case coming to the attention of the board has been investigated and such action taken as the policy of the board demanded. All applications to the board for inspection of herds within the state have been given attention by forwarding to the parties making application a blank form of which the following is a copy:

## STATE OF NEW HAMPSHIRE.

## BOARD OF CATTLE COMMISSIONERS.

## APPLICATION FOR CATTLE INSPECTION.

*To the State Board of Cattle Commissioners, Concord, N. H.:*

GENTLEMEN:—I hereby make application for an official inspection of my herd of cattle in regard to which I make the following statement:

My entire herd consists of.....  
 Number showing disease?.....  
 The disease suspected is.....  
 First noticed symptoms of disease about.....  
 .....  
 The symptoms stated in full, are.....  
 .....

These cattle are in my stable, located about.....  
 miles from.....the nearest  
 railroad station.

If the board considers an investigation advisable, and upon a physical examination finds tuberculosis or other contagious or infectious disease in the herd, I hereby authorize the board to take such action as it may deem best;

with the understanding that the expense of making the examination is to be borne entirely by the board, and that, according to law, I am to receive one half the health value of all animals condemned and destroyed in the presence of myself or of my agent. I also agree to disinfect the stable, and to take other precautionary measures in accordance with the instructions of the cattle commissioners.

.....

P. O. Address.....

Date....., 191 .

NOTE. All applications will be carefully considered, and when, in the opinion of the board, an examination is warranted, a veterinary surgeon will be sent to make an inspection as soon as the case can be reached in its order, usually within two weeks—often within a few days.

With the blank above given is sent the following

#### INSTRUCTIONS.

1. When a herd of cattle, or any animal in it, shows symptoms of tuberculosis, and it is desired that an examination be made by the State Board of Cattle Commissioners, application must be made upon blanks furnished by the board for that purpose, and every symptom fully described.

2. The cattle will not be examined simply upon a suspicion that tuberculosis may be present. The animal must show symptoms of the disease, otherwise an inspection will not be made by the board. A cough, alone, is not sufficiently indicative of tuberculosis, but there must be other symptoms also, chief among them a progressive loss of flesh.

Ordinarily the owner should hold the animal under observation for a sufficient length of time to convince that the disease exists, before bringing the matter to the attention of this board.

3. All investigations authorized by this board will be made by competent veterinary surgeons and will be by physical examination only. The tuberculin test will not be made. For this reason applications for examination should not be

made until the case has reached the stage above referred to.

4. As tuberculosis in cattle is of several months duration before terminating fatally, and even before suspected in some instances, the urgency for investigation is never so great as to require telegraphic or telephonic request for an examination. In all cases the facts should be reported by mail.

It is not always possible to make an investigation at once, even when deemed necessary by the board, as other examinations may have priority; but cases can usually be reached in a few days after the application is received although sometimes ten days or even two weeks may intervene.

6. In the event that any cattle are destroyed by order of this board the state will pay the owner one half the appraised value of the animal in good health; but no losses will be paid upon any animal that has not been in the state at least three months prior to the discovery of the disease.

Payments will be made as soon after the close of the quarter as the bills can be audited by the governor and council. No cattle will be paid for by the state except those destroyed by order of this board.

In connection with this work the language used in a previous report may be repeated:

This plan has been strictly adhered to except in an occasional case where arrangements had been previously made to inspect herds in the immediate vicinity of the person applying, and there was not time to have the blank forwarded and returned. The inspection would then be made without the formal application, as it required no extra expense. Other exceptions have been in the case of applications from boards of health, or in the suspected existence of glanders in horses, both of which have generally had prompt attention.

All applications for inspection in official form, as indicated above, have had careful consideration by the board, and if conditions reported warranted, an official inspection was ordered. The conditions referred to are symptoms of a con-



tagious disease. These applications have generally been given attention in the order in which they were received, and as soon as the exigencies of the case seemed to demand. We have not undertaken to reach cases where haste was necessary in order to arrive before the death of animals, and have not paid for animals that have died before the arrival of the inspector. We have constantly held that the law did not contemplate, primarily, the reimbursement of owners for animals about to die, but that the first object was to destroy such animals as were endangering the health of animals and human beings, and, incidentally, pay the owner such recompense as is provided by the law. We have destroyed all animals found to be tuberculous from a physical examination, whatever their condition, and have attended to all cases within thirty days of receiving official notice, and many of them within one half this period, but have been to no undue haste to get to animals in the last stages of the disease.

It has not been the practice of the board to make a second inspection in a town immediately after a previous visit, but to make the inspection as soon as the circumstances seemed to warrant, using discretion in the matter. In this work the most distant sections of the state have had equal attention with the central, and no inspection has been withheld on account of any extra expense in reaching the herd. The applications made to the board since our previous report, which, upon consideration, were worthy of an investigation, and which are on file as the authority of the board for ordering investigations, are as follows:

DATE OF CATTLE AND STABLE INSPECTION, FISCAL YEAR ENDING SEPTEMBER 1, 1909 AND 1910.  
1907.

Dec.	7.	Breezy Point Hotel Co.,	Warren
------	----	-------------------------	--------

1908.

Aug.	24.	C. W. Blood,	Mont Vernon
	24.	R. H. Prince,	Amherst
	25.	David Keane,	Windham

Sept.	1.	E. B. Boardman,	East Haverhill
	1.	E. W. Bemis,	East Haverhill
	2.	E. G. Annis,	Colebrook
	2.	J. A. Brown,	Candia
	2.	D. Davis,	
	3.	H. B. Worster,	Canaan
	3.	Samuel Blotner,	Atkinson
	7.	Estate of E. H. Winchester,	Portsmouth
	7.	David O. Wilson,	Greenville
	10.	G. H. Sawyer,	Durham
	11.	C. H. Senter,	New Boston
	11.	John C. Libby,	Freedom
	12.	E. E. Graves,	Penacook
	14.	Seth Bunnell,	Colebrook
	15.	G. M. Beard,	Dover
	16.	*Alfred O. Converse,	Rindge
	17.	John P. McNeal,	Tuftonborough
	17.	W. M. Jewett,	Jefferson
	17.	Mrs. E. D. Eastman,	West Canaan
	19.	E. W. Purdy,	Wilton
	19.	W. G. Keene,	Wilton
	19.	John W. Edmunds,	Temple
	22.	Estate of E. Winchester,	Portsmouth
	24.	Andrew C. Felker,	Meredith
	24.	Charles F. Platts,	Rindge
	25.	Mathias Boucher,	Claremont
	26.	E. J. Shattuck,	Nashua
	26.	E. R. French,	Bedford
	28.	E. W. Colburn,	Antrim
	28.	Peter Gilbert,	Dalton
	28.	J. H. Tupper,	Enfield
	29.	A. L. Simmons,	Lyme
	30.	W. L. Kimball,	Plaistow
	30.	W. H. Munsey,	Canterbury
	30.	O. W. Dow,	Canterbury
Oct.	3.	Olin True,	East Haverhill
	3.	Henry F. Dearborn,	East Haverhill

Oct.	3.	James C. Naglie,	Peterborough
	3.	E. A. Brock,	Northwood
	5.	Samuel Chase,	Hudson
	5.	P. J. Connell,	Hudson
	10.	Arthur Fournier,	Bank Village
	12.	George S. Peavey,	Greenfield
	13.	E. A. Hildreth,	Whitefield
	13.	G. A. Walker,	Whitefield
	13.	Hasting Avery,	Warner
	13.	C. F. Hardy,	Contoocook
	14.	Eliza H. Rines,	New Durham
	14.	Percy S. Dow,	Jefferson Highlands
	14.	M. T. Thayer	Starrking
	14.	Merrill Brothers,	Jefferson
	14.	Manchester & Concord Express Co.,	Tilton
	15.	J. H. Winslow,	Whitefield
	16.	E. M. Berry,	New Durham
	16.	Morrill Gray,	Stratford
	16.	T. W. Dearborn,	Dover
	17.	Miss N. O. Pevear,	Freedom
	17.	A. B. Pease,	Freedom
	19.	Charles F. McNally,	Deering
	20.	Charles F. Carlton,	Wilton
	20.	E. W. Doliver	South Lyndeboro
	22.	A. T. Payne,	Epping
	23.	Seth Bunnell,	Colebrook
	24.	E. D. Stockwell,	Lancaster
	24.	T. S. Clark,	Northumberland
	24.	James O. Reed,	Mason
	24.	Christian Maki,	Mason
	26.	Lewis A. Charger,	Piermont
	26.	Rowden & Wood,	Woodsville
	27.	C. H. Palmer,	Epsom
	28.	George C. Evans,	Jefferson
	28.	Oscar Stanley,	Jefferson
	29.	Jane Walker	Hopkinton
	29.	Peter M. Swett,	Wilton

Oct.	29.	J. L. Thomas,	Wilton
	30.	B. H. Cutting,	Milford
	30.	R. W. Pillsbury,	Derry
	31.	B. F. Gregg,	Henniker
	31.	George F. Lynch,	Amherst
	31.	Mrs. J. B. Burt,	Milford
	31.	Livermore Mills,	Livermore
May	22.	Livermore Mills,	Livermore
Nov.	2.	W. D. Foss,	Pembroke
	5.	J. Colby,	Canaan
	5.	Mrs. Mary O. Jenness,	Rye
	5.	W. F. Dunklee,	Francestown
	6.	S. H. & E. R. Weeks,	Greenland
	6.	Pierce Brothers,	Hollis
	6.	John Woods,	Hollis
	6.	F. A. Lovejoy,	Hollis
	7.	F. E. Russell,	Greenfield
	7.	C. L. White,	Antrim
	7.	Fred Merrow,	Lancaster
	8.	J. F. Beamis,	Somersworth
	9.	Ellen M. Naher,	Peterborough
	9.	E. Carter,	Warner
	9.	G. W. Barnes,	Lyme
	10.	W. W. Bunnell,	Lancaster
	10.	C. H. Butman,	Hampstead
	10.	J. H. Robinson,	Pembroke
	11.	A. E. Merrill,	Henniker
	12.	George O. Robinson,	East Concord
	12.	Charles Ingerson,	Jefferson
	13.	Eugene C. Reed,	Randolph
	13.	W. W. Scott,	Windham
	21.	C. A. Hurd	Peterborough
	23.	N. K. Holt,	Milford
	23.	John Boutelle,	Amherst
	23.	J. A. Fitch,	Milford
	24.	Hillsborough County Farm,	Grasmere
	25.	Elmer W. Bunton,	Wilton

Nov.	25.	Joseph S. Keyes,	Wilton
	25.	C. N. Reed,	Wilton
	25.	Frank Belcher,	Greenville
	27.	G. P. Pettingill	Enfield
	27.	Bert N. Tood,	Whitefield
	27.	T. H. Griffin,	Whitefield
	27.	C. P. Robie,	Candia
	27.	J. E. Ray,	Londonderry
	27.	J. E. Howe,	Nashua
	27.	Joseph D. Brown,	Mt. Vernon
	28.	W. L. R. French,	Weare
	28.	Harry B. Wallace,	Whitefield
	28.	Mrs. Calvin Rines,	Carroll
	29.	Fanny Farmer,	Bow
	30.	W. M. Sanborn,	Salisbury
	30.	S. R. Hancock,	Woodsville
	30.	George E. Dunbar,	Lyme
	30.	Isaac Tatterson	Lyme
	30.	A. W. Tuck,	Danville
Dec.	1.	Frank A. Drake,	Newton
	1.	E. M. Lyford,	Canterbury
	1.	A. W. Smith,	Haverhill
	1.	W. W. Brooks	Haverhill
	1.	E. H. Smith,	Haverhill
	2.	E. L. Cutting,	Croydon
	2.	H. C. Kent,	Monroe
	2.	A. J. Chamberlain,	New Durham
	3.	J. T. Cate,	Concord
	3.	Ira W. Mitchell,	Alton
	4.	C. D. Hammond,	Colebrook
	5.	H. B. Clough,	Meadows
	5.	J. W. Button,	Jefferson
	5.	Oscar Stanley,	Jefferson
	5.	Fred J. Robinson,	Durham
	8.	H. P. Matthews,	Chesterfield
	8.	B. C. White,	Concord
	8.	Henry Thompson,	Newfields



Dec.	8.	C. A. Lord,	Dunbarton
	8.	John Hodlin,	Milford
	8.	George W. Chesley,	Concord
	9.	D. J. Wright,	Hollis
	9.	J. W. Howard,	Nashua
	10.	W. L. Cobb,	Lebanon
	11.	Fred B. Kimball,	Greenville
	12.	Ira P. Hutchinson,	Antrim
	15.	F. L. Cass,	Concord
	16.	E. W. Littlefield,	Rollinsford
	16.	E. C. Fitch,	Claremont
	17.	Mrs. Elmer Crockett,	Sanbornton
	17.	C. E. Kimball,	Lancaster
	17.	F. B. York,	Lee
	18.	Solomon Bilow,	Cornish
	19.	W. F. Fogerty,	Derry
	19.	C. F. Melindy,	Wilton
	21.	Joseph H. Blake,	Haverhill
	22.	Joseph R. Weare,	Whitefield
	29.	W. C. Gould,	Whitefield
	29.	Will J. Osborne,	Whitefield
	29.	Murry A. Glines,	Whitefield
	29.	J. C. Kilburn,	Concord
	29.	C. S. Davis,	Warner
	30.	S. T. Cate,	Lebanon
	31.	J. W. Locke,	Hopkinton

1909.

Jan.	1.	C. L. Jenness,	East Wolfeboro
	4.	J. M. Hutchinson,	Wilton
	4.	David Hartshorn,	Lyndeborough
	4.	Myron C. Mason,	Effingham
	7.	Eugene Ingerson,	Jefferson
	7.	John W. Cransham,	Jefferson
	8.	C. W. Barker,	Exeter
	8.	W. D. Tasker	Intervale
	9.	John Dixon,	Lyman
	9.	H. Sanborn,	Chichester

Jan.	11.	E. A. Haskell,	Windham
	11.	Harriet E. Edwards,	Salem
	12.	J. L. Jones,	Raymond
	12.	Daniel McKenzie,	Candia
	14.	Henry Cochrane,	Somersworth
	15.	J. H. Yeaton,	Weirs
	16.	H. A. Cloe,	Wolfeboro
	16.	E. S. Richardson,	Hopkinton
	20.	J. T. Blake,	East Kingston
	20.	M. J. Johnson,	Suncook
	21.	Robert Graves,	Hudson
	23.	Fred T. Connor,	Henniker
	23.	J. T. Connor,	Henniker
	23.	H. H. Livermore,	Wilton
	23.	Addie A. Richards,	East Wilton
	25.	John D. Grimes,	Dublin
	25.	N. D. Hopkins,	Greenfield
	26.	H. E. Spalding,	Hollis
	26.	Charles E. Greeley,	Windham
	30.	Fred M. Brown,	Warner
	30.	Herman Otis,	Whitefield
Feb.	1.	Chester Jordan,	Colebrook
	2.	V. R. Holmes,	Northumberland
	2.	Charles O. Morgan,	Wolfeboro
	2.	E. J. Wright,	Manchester
	3.	Charles Aldrich,	Dalton
	3.	S. M. Richards,	Newport
	3.	F. E. Annis,	Londonderry
	3.	G. W. Reed,	Amherst
	3.	Georgia Watts,	Londonderry
	3.	George F. Pettingill,	Enfield
	4.	D. M. Potter,	Wilton
	4.	H. E. Dutton,	Wilton
	4.	E. W. Purdy,	Wilton
	4.	P. M. Rand,	Portsmouth
	10.	Misses Freeman,	Hillsborough Centre
	11.	J. K. Woodman,	Deerfield

Feb.	12.	E. E. Buxton,	Henniker
	12.	D. M. Pratt,	Whitefield
	12.	H. R. Nichols,	Goffstown
	13.	Harry Paige,	Dover
	13.	J. E. Clough,	Bow
	13.	D. P. Cummings,	Hanover
	19.	George W. Curtis,	Lancaster
	19.	Henry Weber,	Salem
	19.	W. L. Fuller,	Hudson
	20.	C. H. Mann,	Lyme
	22.	Otis D. Remick,	Centreville
	23.	M. Hamm,	Woodman
	24.	W. H. Davenport,	Colebrook
	25.	W. D. Holmes,	Jefferson
	27.	George H. Hardy,	Derry
	27.	R. A. Kendrick,	Derry
	28.	W. D. Howser,	Concord
	28.	A. L. Osgood,	Pittsfield
	28.	L. Emerson,	Manchester
Mar.	1.	George Chandler,	Hopkinton
	1.	John C. Colburn,	Temple
	3.	George W. Plummer,	Londonderry
	3.	F. G. Campbell,	Hollis
	5.	Peter Avard,	East Jaffrey
	8.	C. A. Bailey,	New Boston
	8.	Charles C. Spaulding,	Wilton
	9.	C. S. Stevens	Northfield
	9.	O. N. Billings,	Centre Harbor
	10.	Thomas C. Foster,	Merrimack
	12.	C. Gillingham,	Newbury
	13.	E. C. Goodwin,	Rollinsford
	13.	Allen White,	Sanbornville
	13.	Charles H. Stevens,	Whitefield
	13.	J. B. Whittier,	Deerfield
	15.	E. G. Annis,	Colebrook
	15.	William H. Doonan	Greenville
	15.	Joseph D. Brown,	Mt. Vernon

Mar.	16.	H. G. Putnam,	Acworth
	16.	J. M. Hazen,	Newport
	27.	Fred Weston,	Wilton
	27.	E. O. Goodell,	Sanbornton
	27.	C. P. Edwards,	Wilton
	29.	M. T. Thayer,	Jefferson
	29.	Wallace B. Mack,	Derry
	29.	F. O. Chellis,	Newport
	29.	A. C. Hall,	Salem
	29.	Albert J. Emery,	Milford
	30.	John A. Howard	Haverhill
April	31.	John Kelley	Warner
	6.	Dixville Notch Corporation,	Dixville
	7.	Barron, Merrill & Barron,	Carroll
	8.	Albert Dodge,	New Boston
	8.	J. S. Keyes,	Wilton
	10.	R. A. Walker,	Dublin
	13.	F. P. Rand,	Tilton
	13.	J. B. Mack,	Deerfield
	14.	J. F. Towle,	Enfield
	14.	Fred Plummer	Rollinsford
	15.	J. H. W. Blaisdell,	Contoocook
	16.	Harry A. Chase,	Lyndeborough
	16.	H. M. Baker,	Henniker
	17.	Estate Ezra Page,	Newton
	19.	E. A. Hildreth,	Whitefield
	19.	Mrs. Nellie L. Muzzey,	Jefferson
	19.	S. L. Batchelder,	Concord
	20.	E. R. Yeaton,	Epsom
	20.	Seth Bunnell,	Colebrook
	20.	Chester Jordan,	Colebrook
	21.	D. G. Webster,	Wilmot
	23.	L. N. Sawyer,	Salisbury
	23.	C. & H. E. Aldrich,	Dalton
	24.	Fred Chandler,	Penacook
May	8.	John Heath,	Franklin
	8.	Nathan E. Pitkin,	South Acworth

May	10.	Fred K. Taylor,	Epping
	10.	A. B. Cass,	Epsom
	10.	Aaron G. Young,	North Wakefield
	10.	Robert Will,	Wakefield
	10.	J. G. Como,	Hinsdale
	10.	Daniel A. Colby,	Francestown
	10.	George P. Dunston,	Peterborough
	10.	Martin Brock,	Strafford
	11.	George M. Batchelder,	Wilton
	11.	C. L. Barnes,	Mason
	11.	Mrs. Albert Little,	Colebrook
	11.	Burton A. Corbett,	Colebrook
	11.	H. P. Matthews,	Chesterfield
	12.	George W. Annis,	Colebrook
	12.	Pierce Brothers,	Hollis
	12.	George H. Hardy,	Bedford
	13.	J. G. Clough,	Bow
	13.	F. F. Reed,	Randolph
	14.	T. Y. Marshall,	Jefferson
	14.	R. D. Dresser,	Jefferson
	15.	Mrs. W. A. Tillotson,	Dalton
	15.	Charles E. Peaslee,	Lancaster
	15.	B. E. Aldrich,	Dalton
	15.	J. H. Smith	Raymond
	15.	J. W. Emerson,	Gaza
	18.	A. F. Sargent,	Newport
	18.	Peter Alette	Goshen
	18.	Dearborn & Huckins,	Ashland
	19.	M. E. Buxton,	Henniker
	20.	J. H. Cotton,	Belmont
	21.	Minnie R. Towle,	Freedom
	23.	Ora N. Thayer	Haverhill
	24.	J. F. Hoyt,	Hopkinton
	28.	F. D. Holland,	Milford
	29.	E. R. Tasker,	Hillsborough
	29.	C. & H. E. Aldrich,	Dalton
	29.	Howard Humphrey,	Grasmere



May	31.	F. S. Glidden,	Brentwood
	31.	B. P. Judkins,	Freedom
June	1.	Walter Clark,	Grafton Centre
	1.	O. F. Covell,	Colebrook
	2.	B. F. Pettingill,	Sanbornton
	2.	Ben Fuller,	Jefferson
	2.	A. T. James,	Whitefield
	2.	Albert E. Barnes,	Alton
	4.	W. E. Dow,	Sunapee
	5.	C. A. Eastman,	Concord
	9.	I. N. Smith,	Hudson
	9.	W. A. Love,	Chester
	10.	A. L. West,	Chichester
	11.	J. O. Whitcomb,	Wilton
	12.	Edwin Barnes,	Northumberland
	12.	D. W. Hoag,	Wilton
	12.	A. P. Mason,	Chichester
	15.	O. S. Huntley,	Hillsborough
	15.	George O. Robinson,	Concord
	15.	A. A. Sherman,	Bath
	15.	C. P. Carroll,	Plymouth
	15.	F. L. Hanson,	Centre Sandwich
	16.	O. Mandigo,	Deerfield
	17.	H. E. Messinger,	Lebanon
	17.	Wason Homestead,	New Boston
	17.	John Peters,	Nashua
	17.	F. W. Moore,	Hollis
	19.	Irving Howard,	Stratford
	19.	J. H. Hunt,	Newton
	20.	W. Titus,	North Haverhill
	21.	J. M. W. Kitchen,	Gilmanton
	22.	J. A. Williams,	Concord
	22.	W. E. Davis,	New Ipswich
	24.	D. W. Call,	Salem
	24.	J. H. Kelley,	Plaistow
	25.	F. A. Holbrook,	Amherst
	25.	M. C. Washburn,	Nashua

June	25.	C. W. Brown,	Newfields
	26.	Fred L. Jewell,	Stratham
	28.	Andrew Jackson,	Colebrook
	28.	William E. Wyman,	Milford
	28.	Mrs. J. B. Burt,	Milford
	29.	W. M. Jewett,	Meadows
	29.	F. J. Colby,	Enfield
	29.	J. S. Quimby,	Sandwich
	30.	C. A. Young,	Easton
	30.	Harry Page,	Dover
July	2.	F. W. Hooper,	Henniker
	3.	S. T. Cole,	Lebanon
	3.	Peter M. Scott,	Wilton
	5.	C. R. Richardson,	Peterborough
	5.	B. F. Tenney,	Antrim
	5.	L. F. Richardson,	Peterborough
	6.	E. R. Perkins,	Exeter
	7.	M. E. Warriner,	Bow
	8.	W. M. Chandler,	Amherst
	8.	John McGary,	Lancaster
	8.	M. D. Chase,	Concord
	9.	E. J. Short,	Enfield
	12.	M. Emma Conant,	Mt. Vernon
	12.	P. Hanson,	Concord
	14.	M. O. Matherson,	Warner
	15.	W. Page,	Goffstown
	16.	George B. Lake,	Pembroke
	21.	Blanchard Brothers,	Greenfield
	21.	W. E. Boynton,	Antrim
	24.	C. F. Melindy,	Wilton
	24.	F. C. Reynolds,	Greenfield
	26.	Frank Page,	Dover
	27.	N. A. Nordin,	Bow
	27.	Frank C. Tyler,	Freedom
	27.	E. P. Moulton,	Tuftonborough
	27.	Alex Georniesior,	Hollis
	27.	J. O. Furber,	Londonderry

July	27.	C. E. Doying,	Nashua
	28.	Allen Ludgate,	Bartlett
	28.	George B. Reed,	Columbia
	28.	W. A. Marshall,	Colebrook
	28.	S. D. Moses,	Meredith
Aug.	29.	Charles A. Perry,	Haverhill
	3.	T. S. Lowe,	Randolph
	9.	J. A. Ray,	Londonderry
	10.	Middlebrook Farm,	Dover
	11.	Ed. Lyford,	Canterbury
	11.	J. A. Beck,	Canterbury
	11.	W. W. Wood,	Lebanon
	11.	E. W. Dolliver	Lyndeborough
	13.	W. D. Brooks,	Easton
	13.	H. G. Perham,	Acworth
	14.	F. O. Ordway,	Bow
	16.	A. H. Bickford,	Pittsfield
	16.	E. R. French,	Bradford
	17.	W. O. Tenney,	Greenville
	17.	E. F. Blanchard,	Smithville
	20.	Abia Hutton,	Hampstead
Sept.	1.	G. W. Varney,	Dover
	1.	P. C. Hutchinson,	Pembroke
	2.	Theophite Pilate,	Dalton
	3.	J. H. Chase,	Warner
	3.	Mrs. A. K. Judd,	Easton
	4.	C. D. Pike,	Lyman
	4.	C. K. Webster,	East Kingston
	6.	Whitefield Farm Company.	Whitefield
	6.	High Corrigan,	Lancaster
	6.	C. R. Knowles,	Belmont
	6.	Maurice Herlihy,	Mt. Vernon
	7.	Lyman Hicks	Colebrook
	7.	H. P. Sanborn,	Croydon
	7.	A. C. Smith,	Raymond
	9.	W. H. Belknap,	Enfield
	10.	George S. Peavey,	Greenfield

Sept.	10.	A. A. Banks,	Temple
	11.	Fred D. Lewis	Bethlehem
	11.	F. G. Hall,	Brookline
	13.	George D. Graham,	Lakeport
	13.	E. G. Annis,	Columbia
	13.	J. H. Haines,	Concord
	14.	Mrs. H. S. Sawyer,	Enfield
	15.	John H. Coburn,	Concord
	16.	Frank Ingerson,	Jefferson
	16.	J. F. Beamis,	Somersworth
	17.	Thomas D. Simpson,	Highlands
	17.	L. W. Ingraham,	Fitzwilliam
	17.	John Kankruen,	Troy
	18.	Charles Reed,	Wilton
	18.	E. H. Russell,	Greenville
	24.	Concord Lumber Company,	Concord
	28.	Fred W. Hubbard,	Amherst
	29.	N. P. Cook,	Barnstead
	29.	A. F. Newell,	Whitefield
	29.	Mrs. A. S. Moye,	Whitefield
	30.	Julia H. Lougee,	New Ipswich
	30.	Edward E. Bennett,	Erroll
Oct.	1.	A. E. Davidson,	Conway
	2.	Harry Hodsdon,	Piermont
	5.	Joseph Louvie,	Epping
	8.	E. M. Bray,	Whitefield
	11.	George O. Barney,	Carroll
	12.	Chester Potter,	Conway
	12.	F. W. Page	Whitefield
	13.	C. F. Annis,	Warner
	13.	Robert Lamprey,	Wolfeboro
	14.	J. Arthur Richards,	Goffstown
	14.	J. P. Sweatt,	Peterborough
	14.	George A. Reynolds,	Greenfield
	14.	E. R. Wright, M. D.,	Alton
	19.	N. E. Farrar,	Hillsborough
	20.	C. O. Kimball,	Lancaster

Oct.	21.	James P. Morse,	Dalton
	21.	B. C. Goodwin,	Whitefield
	21.	H. Fowler,	Short Falls
	21.	A. G. Graves,	Hudson
	21.	Philip Connoll,	Hudson
	22.	Miles W. Gray,	Columbia
	23.	L. W. Crowninshields,	Hinsdale
	23.	Frank French,	Chichester
	25.	Frank Pender,	Northwood
	27.	B. C. Sanborn,	Deerfield
	29.	James L. Thomas,	Wilton
	29.	L. C. Dow,	Bristol
	29.	Bert N. Tood,	Whitefield
	30.	N. B. Rines,	Carroll
Nov.	30.	Rupert Kidder,	Mascoma
	1.	George C. Evans	Jefferson
	1.	Edwin E. Paschel,	Randolph
	2.	George W. Eaton,	Bradford
	2.	W. E. Carpenter,	Bath
	2.	Amos S. Clark,	Sandown
	2.	C. P. Robie,	Candia
	4.	C. L. Jenness,	Wolfeboro
	4.	Henry D. Cotton,	Wolfeboro
	4.	C. E. Colby,	Bow
	5.	J. A. Holt,	Candia
	5.	A. M. Carpenter,	Wilton
	5.	F. A. Holbrook,	Amherst
	5.	Nathan Katz,	Portsmouth
	6.	John Gordon,	Carroll
	8.	Brown, Merrill & Barron,	Carroll
	8.	Daniel Wheeler,	Groton
	9.	B. F. Adams,	Sutton
	9.	W. M. Gray,	Columbia
	10.	Daniel Putnam,	Conway
	15.	E. W. Hill,	Strafford
	16.	L. B. Simpson,	Concord
	22.	Gilbert D. Jaques,	Nashua



Nov.	22.	Elmer H. Fields,	Merrimack
	23.	H. W. Brooks,	Dover
	23.	G. J. Pinneo,	Hampstead
	24.	Ed. W. Dolliver,	Lyndeborough
	24.	L. H. Baldwin,	Wilton
	24.	A. D. Emery,	Northwood
	24.	L. Hill,	Northwood
	24.	A. T. James,	Whitefield
	24.	S. W. Fowler,	Freedom
	24.	C. H. Mitchell,	Stratford
	24.	Stephen Connor,	Warren
	25.	Annie R. Bennett,	Wolfeboro
	26.	Welcome Brown,	Lancaster
	26.	J. P. Weeks,	Greenland
	27.	H. M. Baker,	Henniker
	27.	G. C. Preston,	Henniker
	27.	Charles H. Emerson,	Lancaster
	29.	F. E. Pedrick,	Wilmot
Dec.	1.	E. H. Patch,	Francestown
	2.	L. J. Hayden,	Hollis
	2.	C. J. Upham,	Amherst
	2.	W. N. Hayden,	Hollis
	3.	W. L. Webster,	Canaan
	6.	L. R. Thompson,	Tilton
	7.	J. H. Savage,	Henniker
	7.	Charles D. Robertson,	Henniker
	7.	Charles H. Crawford,	Jefferson
	7.	Abel Largey,	Jefferson
	7.	C. A. Whittier	Wolfeboro
	8.	Charles A. Robbin,	Whitefield
	8.	J. A. Clough,	Loudon
	8.	Aaron G. Young,	Wakefield
	9.	J. F. Beamis,	Somersworth
	10.	H. H. Archibald,	Barnstead
	10.	Charles F. Platz,	Rindge
	11.	Ira P. Hutchinson,	Antrim
	11.	Arthur Cunningham,	Antrim

Dec	14.	George Guerin,	Weare
	17.	Pierce Brothers,	Hollis
	17.	Obadiah Lawrence,	Hollis
	29.	T. H. Maxfield,	Pittsfield
1910.			
Jan.	1.	Mrs. Rosia Robbins,	Lancaster
	1.	E. H. Parker,	Whitefield
	1.	Samuel Avery,	Wolfeboro
	3.	C. T. Smith,	Gilmanton
	3.	Nellie L. Muzzey,	Jefferson
	3.	Town of Barnstead,	Barnstead
	3.	Lewis F. Young,	Union
	5.	C. W. Wilkins,	Henniker
	5.	Howard W. Burrill,	Monroe
	7.	G. W. Crawford,	Jefferson
	7.	A. S. Clark,	Chester
	8.	Henry T. Miller,	Francestown
	8.	E. B. Leavitt,	New Boston
	8.	C. H. Dore,	Wolfeboro
	8.	H. R. Sanborn,	Croydon
	8.	Clarence Sanborn,	Milford
	10.	Quincy B. Davis,	Colebrook
	12.	Frank Asbonset,	Conway
	13.	George T. Page,	Orford
	13.	Christopher Lenz,	Merrimack
	13.	C. A. Spaulding,	Rumney
	12.	A. E. Mills,	Hampstead
	15.	George S. Peavey,	Greenfield
	15.	J. Silver, Jr.,	New Ipswich
	19.	John W. Cranshaw,	Jefferson
	20.	Samuel Avery,	Wolfeboro
	20.	E. N. Severance,	Wolfeboro
	21.	T. G. Rowan,	Colebrook
	22.	S. H. Abbott,	Wilton
	24.	C. E. Walsh,	Hudson
	25.	Lizzie K. Remick,	Littleton
	25.	H. E. Spaulding,	Hollis

Jan.	25.	Robert Converse,	Amherst
	28.	Charles Knowles,	Union
	29.	Levi W. Ladd,	Melvin Village
	31.	John Fitzmorris,	Whitefield
	31.	Dixville Notch Corporation,	Dixville Notch
Feb.	1.	C. E. Quint,	Fitzwilliam
	8.	John P. Hayes,	Farmington
	10.	William C. Hills,	Antrim
	10.	Jacob Kendall,	Wilton
	10.	Harris Gray,	Columbia
	10.	W. W. Corbett,	Colebrook
	11.	George Dawson,	Jefferson
	11.	P. C. Hutchinson,	Epsom
	11.	J. L. Pattee,	Jefferson
	15.	J. H. Robinson,	Pembroke
	16.	F. H. Stearns,	Ponemah
	16.	A. L. Wright,	Merrimack
	16.	C. A. Winters,	Fitzwilliam
	18.	John Beck,	Canterbury
	22.	Thomas Murtough	Lancaster
	23.	N. W. Dailey,	Twin Mts.
	25.	Seth Bunnell,	Columbia
	26.	Horace Gray,	Jefferson
	26.	C. E. Morrill,	Canterbury
	26.	John E. Cooper,	Northwood
Mar.	1.	E. C. Mills,	Hampstead
	2.	W. E. Sharon,	Stoddard
	7.	Horace A. Locke,	Rye
	10.	F. A. Pettingill,	Lyndeboro
	12.	C. E. Treat,	Fitzwilliam
	14.	Dearborn & Huckins,	Ashland
	14.	H. Page Holt,	Greenfield
	16.	C. W. Bridges,	Amherst
	17.	W. F. Duncklee,	Francestown
	17.	L. A. Emerson,	Laconia
	18.	Teresa A. Stillings,	Jefferson
	18.	George A. Nevens,	Jefferson

Mar.	18.	Elmer F. Wheeler,	Manchester
	18.	A. F. Kimball,	Hubbard
	19.	F. Jaquith,	Derry
	23.	H. A. Dexter,	Bath
	24.	Wilber W. Corbett,	Colebrook
	24.	Payson Fernald,	Lancaster
	30.	Mary B. Sawyer,	Jaffrey
	30.	C. S. Bickford,	Epsom
	30.	H. E. Etheridge,	Epsom
	31.	Henry Cochrane,	Somersworth
April	1.	C. C. Damon,	Hampstead
	3.	Minot Stearns,	Wilmot
	3.	F. E. Kallenburg,	Deerfield
	9.	John True,	Canterbury
	9.	F. E. Russell,	Greenfield
	11.	Sanborn & Brown,	Lancaster
	11.	Joseph McDaniel,	Springfield
	14.	H. A. Curran,	Hanover
	15.	Frank Leslie,	Portsmouth
	15.	A. C. Hall,	Salem
	16.	N. B. Hackett,	Centre Harbor
	16.	C. L. Kendall,	Milford
	16.	William J. McKenzie,	Milford
	16.	Gilford Brothers,	Concord
	18.	A. Fainstein,	Pittsfield
	20.	E. E. Newton,	Ashland
	21.	G. W. Hayes,	Madison
	23.	George Elliott,	Dalton
	25.	Charles Aldrich,	Dalton
	26.	G. D. Austin,	Cornish
May	30.	F. L. Charles,	Pembroke
	30.	Allen Swazey,	Wolfeboro
	30.	G. W. Kimball, Jr.,	Lawrence, Mass.
	2.	Mrs. G. A. Hillsgrove,	Barnstead
	2.	G. C. Leavitt,	Effingham
	2.	M. S. Brock,	Strafford
	3.	George O. Underwood,	Jaffrey

May	5.	O. J. Avery,	Mountainview
	6.	E. M. Lyford,	Canterbury
	5.	Charles Willard,	New Ipswich
	7.	Mrs. Philip Richer,	Stoddard
	9.	Ernest T. Page,	Pike
	9.	C. J. Sawyer,	Haverhill
	10.	S. G. Potter,	Concord
	10.	A. D. Hill,	Portsmouth
	10.	V. A. Bean,	Sharon
	10.	G. F. Shaw,	Rochester
	11.	N. E. Smith,	Londonderry
	11.	E. H. Russell,	Greenville
	11.	A. H. Danforth,	Newbury
	12.	E. A. Savage,	Milford
	13.	W. E. Joy,	Pittsfield
	17.	J. M. W. Kitchen,	Gilmanton
	18.	M. L. Fowler,	Pembroke
	18.	J. O. Whitcomb,	Wilton
	18.	C. P. Edwards,	Wilton
	19.	E. G. Robinson,	Exeter
	20.	W. E. Bunce,	Jaffrey
	20.	Nathaniel Farrant,	Antrim
	21.	Samuel J. Sheldon,	Wilton
	21.	C. A. Reed,	Wilton
	21.	Jesse Goodwin,	Concord
	21.	H. C. Smith,	Holderness
	21.	T. R. Edmunds,	Surry
	24.	G. H. Clark,	Deerfield
	24.	F. M. Pettingill,	Pembroke
	26.	W. J. Hammond,	Colebrook
	26.	I. H. Flanders,	Colebrook
	26.	Samuel Chase,	Hudson
	26.	Fred G. Steele,	Hudson
	27.	E. C. Locke,	Hopkinton
	28.	Charles Mason,	Orford
	28.	Charles Dodge,	Piermont
June	4.	E. Burnett,	Peterborough



June	6.	H. A. Wilcox,	Newport
	6.	Sydney W. Rines,	Carroll
	6.	E. M. Bray,	Whitefield
	6.	W. D. Perkins & Son,	Jefferson
	7.	John Libby,	Lancaster
	7.	W. H. Knight,	Lancaster
	7.	L. H. Clark,	Canaan
	9.	B. S. Bathrow,	Enfield
	10.	O. D. Fessenden,	Brookline
	10.	R. M. Boutwell,	Exeter
	13.	A. G. Whittier,	Newton
	14.	Sarah E. Sharp,	New Boston
	14.	Charles H. Sargent,	New Boston
	14.	C. S. Hall,	Epsom
	14.	F. J. Merrifield,	Troy
	14.	William D. Brooks,	Easton
	16.	E. M. Downing,	Bow
	16.	Fred Farr,	Spofford
	16.	J. C. Milliken,	Candia
	20.	Gilbert Astles,	Bow
	21.	H. W. & C. E. Frye,	Wilton
	21.	W. D. Tasker,	Intervale
	22.	O. G. Putney,	Washington
	22.	Knute Johnson,	New Boston
	23.	Oscar Frazer,	Landaff
	25.	Fred O. Farr,	Spofford
July	2.	M. R. Glazier,	Landaff
	2.	W. W. Presby,	Lisbon
	2.	Raymond B. Stevens,	Landaff
	6.	W. I. Lincoln Adams,	Littleton
	6.	F. T. Ramsey,	Easton
	11.	J. E. Byson,	Exeter
	15.	Gilbert Kniveton,	Greenville
	15.	Ed. Lawn,	Canaan
	15.	C. H. George,	Bartlett
	19.	S. S. Jenness,	Pittsfield
	20.	G. N. Burnham,	Dorchester

July	21.	E. D. Ewer,	Lancaster
	21.	Frank I. Williams,	Colebrook
	23.	J. S. Keyes,	Wilton
	23.	F. A. Holbrook	Amherst
	29.	J. R. Harrington,	Mason
	29.	V. A. Elliott,	Brookline
	30.	H. Page Holt,	Greenfield
	30.	George S. Peavey,	Greenfield
	30.	George O. Cook,	Centre Sandwich
	30.	Wallace Keezar,	Danville
	30.	F. S. Converse,	New London
Aug.	1.	Mrs. A. J. Abbott,	East Kingston
	1.	William B. Smith,	Milford
	2.	J. M. Kimball,	Danville
	5.	Ellery Harvey,	Hinsdale
	8.	A. L. Wright,	Merrimack
	8.	G. F. Shaw,	Rochester
	11.	W. D. Tasker,	Intervale
	12.	Joseph Monger,	Pembroke
	12.	G. O. Batties	Loudon
	15.	F. M. Harding,	Sunapee

## FINANCIAL STATEMENT.

September 1, 1908, to September 1, 1909.

408 tuberculous cattle (one half health value) ..	\$7,343.25
20 glandered horses (diseased value) .....	100.00
Service of veterinarians .....	1,641.75
Expense of veterinarians .....	1,031.44
Service and expense of board .....	1,244.06
	<hr/>
	\$11,360.50

## FINANCIAL STATEMENT.

September 1, 1909, to September 1, 1910.

282 tuberculous cattle (one half health value) ..	\$4,795.75
13 glandered horses (diseased value) .....	65.00
Service of veterinarians .....	1,302.00
Expense of veterinarians .....	810.26
Service and expense of board .....	2,024.75
	<hr/>
	\$8,997.76

An itemized exhibit of the foregoing expenditures with accompanying vouchers has been submitted to the governor and council, approved, and placed on file.

### ADMISSION OF CATTLE TO THE STATE OF NEW HAMPSHIRE.

During the period covered by this report permits were issued to admit cattle to the state for pasturing purposes, the same to be returned to their respective states at the close of the pasturing season unless tested with tuberculin and the report of results forwarded to the State Board of Cattle Commissioners, when a permit would be given to allow them to remain in the state, if the test showed them to be free from tuberculosis.

These permits cover several thousand head of cattle. In addition thereto, many permits have been issued admitting cattle to the state to remain permanently, such permits having been based in all cases upon the tuberculin test.

In no instance are cattle now admitted to the state of New Hampshire (except for pasturage, or for exhibition purpose) until they have passed the tuberculin test at the hands of a competent veterinary surgeon. This regulation seems to be necessary for the protection of the purchaser, as well as the state, inasmuch as the laws and regulations of some of the adjacent states are so strict as not to admit of the return of animals in case they should not pass the tuberculin test in this state. Therefore, the board has felt obliged to enforce this regulation to the letter.

### CONCLUSION.

The work during the period covered by this report has been conducted along the lines followed in previous years with the addition of greater effort in the matter of disinfection of premises where diseased animals were destroyed. In all such instances the veterinarians have left with owner or manager of such stables written instruction as to what

steps to take to prevent the reappearance of the disease and a signed statement by the owner or manager that such instruction had been carried out has been made a condition of payment for animals destroyed. We are still of the opinion as expressed in previous reports and acted upon as far as possible, that preventive measures regarding light and ventilation of stables are most effective and far-reaching in dealing with this matter. It is necessary as the foundation of suppressing tuberculosis in cattle to remove diseased animals, but this alone will not fully accomplish the purpose of the action taken. Abundant light and good ventilation in stables must follow the removal of diseased animals and disinfection if permanent results are to be obtained. Acting upon this principle, a vigorous effort has been made to secure its adoption, and we hope with tangible and permanent effect.

Respectfully submitted,

IRVING A. WATSON,

N. J. BACHELDER,

RICHARD PATTEE,

*Board of Cattle Commissioners.*





NEW HAMPSHIRE STATE GRANGE, 1910.

---

POMONA AND SUBORDINATE GRANGES.



# NEW HAMPSHIRE STATE GRANGE.

---

## OFFICERS.

Master, RICHARD PATTEE, Plymouth.  
Overseer, WESLEY ADAMS, Derry.  
Lecturer, ANDREW L. FELKER, Meredith Center.  
Steward, W. H. TRIPP, Short Falls.  
Assistant Steward, M. O. SPAULDING, Keene.  
Chaplain, HORACE F. HOYT, Etna.  
Treasurer, JOSEPH D. ROBERTS, Dover.  
Secretary, GEORGE R. DRAKE, Manchester.  
Gate Keeper, HENRY M. BEARD, Grasmere.  
Ceres, MRS. ESTHER E. PATTEE, Plymouth.  
Pomona, MRS. EYV C. COTTON, Starrking.  
Flora, MRS. LILLIAN S. NEWELL, Contoocook.  
Lady Assistant Steward, MRS. NELLIE G. LAKE, Brentwood.

## EXECUTIVE COMMITTEE.

Chairman, RICHARD PATTEE, *ex officio*.  
Secretary, GEORGE R. DRAKE, *ex officio*.  
A. J. RICHARDSON, Littleton.  
CHARLES W. BARKER, Exeter.  
WILLIAM A. COWLEY, East Concord.

## GENERAL DEPUTY.

Orville P. Smith, Ashland.

## POMONA DEPUTIES.

District No. 1. Hadley B. Worthen, Bristol.  
District No. 2. C. Waldo Phillips, East Candia.

## DISTRICT DEPUTIES.

- No. 1. Elbridge G. Arlin, Colebrook.
- No. 2. Charles A. Cole, Percy.
- No. 3. Albert L. Farr, Littleton.
- No. 4. John E. Eastman, North Haverhill.
- No. 5. Leon N. Bryar, West Rumney.
- No. 6. Iza J. Smith, Plymouth.
- No. 7. David F. Carpenter, Mountain View.
- No. 8. Hollis L. Wiggins, Meredith.
- No. 9. Arthur V. Doud, Bristol.
- No. 10. Fred B. Gay, New London.
- No. 11. George R. Hammel, Belmont.
- No. 12. Charles A. Rollins, West Alton.
- No. 13. Albion G. Weeks, Rochester.
- No. 14. Charles A. Tebbets, Rochester.
- No. 15. Wesley O. Field, East Concord.
- No. 16. George L. Flanders, Warner.
- No. 17. Loyal Barton, Grantham.
- No. 18. George Earl Jackman, Claremont.
- No. 19. Fred W. Saltmarsh, Suncook.
- No. 20. J. Harry Roberts, Dover, R. D. 2.
- No. 21. Edward Paterson, Portsmouth.
- No. 22. Stevens W. Perkins, Exeter.
- No. 23. Wilbur H. White, Raymond.
- No. 24. Harry W. Spaulding, Manchester.
- No. 25. Carl B. Pattee, Goffstown.
- No. 26. Carroll W. Farr, North Weare.
- No. 27. Cummings B. McClure, Munsonville.
- No. 28. Sherman L. Rice, Brattleboro, Vt.
- No. 29. Wallace S. Hadley, Peterborough.
- No. 30. Fred W. Dudley, Hollis.
- No. 31. Frank H. Corning, Reeds Ferry.
- No. 32. Arthur S. Andrews, Hudson.

# POMONA GRANGES.

No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
16	Ammonoosuc Valley, Lisbon..... July 1, 1897—Bachelder.	326	George E. Powers, Master. Mrs. Ella Bowles, Lecturer. Mrs. Jennie C. Franklin, Sec. Paul R. Cole, Master. Edna Astle, Lecturer. Harry W. Stone, Secretary.
15	Androscoggin Valley, West Milan May 26, 1896—Bachelder.	144	Harvey A. Jewett, Master. Mrs. Lizzie James, Lecturer. Mrs. Eva M. Brown, Secretary.
4	Belknap County, Laconia..... November 10, 1887—Bachelder.	588	George W. Copp, Master. Mrs. Georgia P. Blake, Lecturer. Mrs. Flora B. Haley, Secretary.
8	Carroll County, Ossipee..... May 8, 1891—Towle.	508	Merrill Mason, Master. Mrs. Susie A. McClure, Lecturer. D. Minot Spaulding, Secretary.
6	Cheshire County, Keene..... April 25, 1888—McDaniel.	560	Charles A. Tebbets, Master. Mrs. Edith A. Lambertson, Lect. Mrs. Carrie E. Varney, Sec.
2	Eastern N. H., Rochester..... November 19, 1884—Hutchinson.	750	Charles W. Barker, Master. Mrs. Nellie G. Lake, Lecturer. Annie M. Perkins, Secretary.
11	East Rockingham, Exeter..... September 22, 1892—Bachelder.	670	Will B. Gile, Master. Mrs. Adella Allen, Lecturer. W. H. Mould, Secretary.
19	Gov. Bachelder, Raymond..... December 12, 1903—Bachelder.	178	Ora N. Thayer, Master. Mrs. Ella G. Hamlett, Lecturer. Mrs. Susie C. Atwood, Secretary.
13	Grafton County, Rumney..... February 14, 1894—Bachelder.	318	Arthur A. Goss, Master. Henry M. Beard, Lecturer. Mrs. Mary A. Gove, Secretary.
1	Hillsborough County, Milford..... April 17, 1883—Wason.	696	Mrs. Eva L. Phillips, Master. Mrs. Louise W. Gordon, Lect. Mrs. Ivanett Gray, Secretary.
17	Lake and Valley, Bristol..... May 14, 1901—Drake.	318	G. B. Clough, Master. C. A. Taylor, Lecturer. Mrs. Martha A. Slayton, Sec.
7	Mascoma Valley, Lebanon..... January 4, 1890—McDaniel.	424	Fred W. Roby, Master. Robert W. Upton, Lecturer. H. B. Quint, Secretary.
3	Merrimack County, Concord..... February 9, 1886—Stinson.	500	Edgar B. Morse, Master. Mrs. Flora J. Miles, Lecturer. Mrs. Evy C. Cotton, Secretary.
5	Northern N. H., Littleton..... January 24, 1888—McDaniel.	384	Fred W. George, Master. Mrs. Esther E. Pattee, Lecturer. Mrs. Anna Lougee, Secretary.
18	Pemigewasset Valley, Plymouth.. March 13, 1903—Hoyt.	326	Charles L. Russell, Master. Mrs. Inez L. Russell, Lecturer. Frank H. Weld, Secretary.
9	Sullivan County, Newport..... December 4, 1891—McDaniel.	385	



No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
12	Suncook Valley, Pembroke..... October 11, 1892—Bachelder.	177	{ Charles A. Brown, Master. Orrin M. James, Lecturer. Mrs. Annie M. Fowler, Sec.
20	Union, Manchester..... May 4, 1909—G. P. Hadley.	287	{ G. Waldo Browne, Master. Curtis B. Childs, Lecturer. Mrs. Hester J. Sanford, Sec.
14	Upper Coos, Colebrook..... November 26, 1895—Bachelder.	228	{ Maurice M. Cass, Master. Mrs. Elnora Schoff, Lecturer. Mrs. Lizzie L. Whittemore, Sec.
10	West Rockingham, Sandown..... September 21, 1892—Bachelder.	340	{ Amos G. Corning, Master. Mrs. Annie B. M. Stevens, Lect. J. M. Goodrich, Secretary.

## SUBORDINATE GRANGES.

No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
20	Advance, Wilton ..... February 20, 1874—Shaw.	132	{ Mrs. Mary A. Rideout, Master. Erland G. Batchelder, Lecturer. Mrs. Mary S. Flint, Secretary.
55	Ammonoosuc, Swiftwater..... April 21, 1875—Keyes.	69	{ T. E. Stevens, Master. Mrs. Carrie Tewksbury, Lect. Mrs. Lucy Burnham, Secretary.
3	Amoskeag, Manchester..... August 26, 1873—Thompson.	427	{ Will H. Eaton, Master. Mrs. Florence F. Spaulding, Lect. Mrs. Idella J. Ferguson, Sec.
228	Androscoggin, Milan ..... June 17, 1895—White.	140	{ Nelson B. Wheeler, Master. Mrs. Cora E. Morse, Lecturer. Oscar E. Twitchell, Secretary.
98	Antrim, Antrim ..... December 11, 1883—Wason.	88	{ Harry C. Tenney, Master. Alfred G. Holt, Lecturer. Linda E. Hutchinson, Secretary.
139	Arlington, Winchester ..... January 29, 1889—White.	140	{ Roy L. Bishop, Master. Mrs. Clara Bennett, Lecturer. Mrs. Helena Stone, Secretary.
129	Ashuelot, Gilsum..... February 18, 1888—Hutchinson.	111	{ Oscar J. Willson, Master. Jennie Beckwith, Lecturer. William Woods, Secretary.
143	Atkinson, Atkinson..... November 29, 1889—Batchelder.	196	{ Walter B. Lang, Master. Mrs. Susie A. Goodrich, Lect. J. M. Goodrich, Secretary.
235	Aurora, Pittsburg..... December 12, 1905—White.	101	{ H. A. Blanchard, Master. Jesse Blanchard, Lecturer. Mrs. Etta Arney, Secretary.
290	Baker's River, West Rumney.... November 10, 1900—Drake.	91	{ Leon N. Bryar, Master. Esther Swett, Lecturer. Mrs. Clara L. Hall, Secretary.
265	Banner, East Rochester..... December 15, 1907—Wentworth.	67	{ Elihu A. Corson, Master. Mrs. Mary S. Weare, Lecturer. James E. Hickey, Secretary.
119	Barnstead, Centre Barnstead..... February 24, 1887—Hutchinson.	30	{ Hanson H. Young, Master. Mrs. G. M. Davis, Lecturer. Mrs. Myra A. George, Secretary.
104	Bartlett, Salisbury..... November 22, 1884—Pattee.	69	{ Rufus Emerson, Master. Vira E. Marshall, Lecturer. George C. Emerson, Secretary.
301	Batchelder, South Manchester.... March 4, 1903—Drake.	89	{ Ernest E. Austin, Master. Lizzie A. Burns, Lecturer. Mrs. Etta M. Lang, Secretary.
295	Bay, Sanbornton..... March 25, 1902—Hoyt.	46	{ George A. Leavitt, Master. Mrs. Cora H. Frost, Lecturer. Daniel P. Huse, Secretary.
29	Bear Hill, Henniker..... September 29, 1874—Shaw.	188	{ John A. Connelly, Master. Curtis B. Childs, Lecturer. Maude M. Tucker, Secretary.

No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
283	Beaver, Springfield..... September 23, 1859—Gay.	111	{ Carl B. Philbrick, Master. Mrs. Angelia W. Woodward, Lect. Mrs. Ada W. Philbrick, Sec.
207	Bennington, Bennington..... January 8, 1894—White.	62	{ Charles F. Burnham, Master. Mrs. Mary L. Knight, Lecturer. Mrs. Martha E. Knight, Sec.
203	Bethlehem, Bethlehem..... March 20, 1893—White.	77	{ Ira Simonds, Master. Ida Dexter, Lecturer. (Vacancy caused by death) Sec.
152	Blackwater, Andover..... May 22, 1890—McDaniel.	56	{ Alvin J. Eaton, Master. Mrs. Emma J. Eaton, Lecturer. Solomon Dodge, Jr., Secretary.
71	Blazing Star, Danbury..... December 9, 1875—Boyden.	82	{ Edward Farnum, Master. Eva Perkins, Lecturer. Mrs. Jennie Ford, Secretary.
234	Blow-Me-Down, Plainfield..... December 11, 1895—Fitch.	77	{ Henry C. Daniels, Master. Rosamond S. Jordan, Lecturer. Austin W. Burr, Secretary.
282	Blue Mountain, Grantham..... November 22, 1895—Fitch.	75	{ Mrs. Carrie H. Buswell, Master. Mrs. Lena F. B. Reed, Lecturer. Flora M. Kimball, Secretary.
189	Bow, Bow..... September 29, 1892—Bachelder.	229	{ William A. White, Master. Mrs. Ida F. Quint, Lecturer. Alma E. Nelson, Secretary.
80	Bow Lake, Strafford..... February 17, 1876—Smith.	72	{ George B. Leighton, Master. Mrs. Sadie Shaw, Lecturer. Guy M. Hall, Secretary.
58	Bradford, Bradford..... May 22, 1885—Clark.	90	{ Louis J. Keyser, Master. Mrs. Sara R. Hadley, Lecturer. Elva J. Bailey, Secretary.
211	Brookline, Brookline..... March 14, 1894—Hutchinson.	80	{ William J. Bailey, Master. Mrs. Edna Hall, Lecturer. Mrs. Hattie F. Pierce, Secretary.
93	Campton, Campton..... April 16, 1878—Mann.	82	{ Mrs. Anna Lougee, Master. Ida M. Hall, Lecturer. Lucy E. Cook, Secretary.
167	Candia, Candia..... January 8, 1892—Bachelder.	142	{ Mrs. Grace L. Ordway, Master. Mrs. Mary A. Cass, Lecturer. Charles F. Flanders, Secretary.
254	Cape Horn, Northumberland..... April 23, 1897—White.	109	{ Earl Stevens, Master. Hattie Whitcomb, Lecturer. Richard Beattie, Secretary.
113	Capital, Concord..... January 30, 1886—Stinson.	306	{ H. H. Metcalf, Master. Mrs. A. Lizzie Sargent, Lecturer. Mrs. Carrie D. Sargent, Sec.
267	Cardigan, Alexandria..... January 19, 1898—White.	65	{ Walter S. Ferrin, Master. Mrs. Eva L. Phillips, Lecturer. Mrs. C. A. Bullock, Secretary.
160	Carroll, Ossipee..... February 6, 1891—Bachelder.	54	{ Mrs. Minnie M. Young, Master. Mrs. Blanch McGilvray, Lect. J. E. Hodgdon, Secretary.
97	Catamount, Pittsfield..... December 3, 1883—Stinson.	110	{ Guy C. Nichols, Master. Mrs. Annie J. Sanborn, Lecturer. Louis A. French, Secretary.

No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers,	OFFICERS.
185	Centennial, Barrington..... May 16, 1892—Wentworth.	58	{ Henry W. Locke, Master. Edith L. Locke, Lecturer. Mrs. Hattie B. Locke, Secretary.
204	Charlestown, Charlestown..... November 9, 1893—White.	69	{ W. E. Hunt, Master. W. P. Holcomb, Lecturer. Mrs. Hattie M. Greene, Sec.
201	Cherry Mountain, Carroll..... March 8, 1893—White.	90	{ Duncan McMillian, Master. Mrs. Flora J. Miles, Lecturer. C. A. Leavitt, Secretary.
131	Cheshire, Keene..... March 29, 1888—White.	377	{ Frank E. Chase, Master. Mrs. Gertrude E. Spaulding, Lect. D. M. Spaulding, Secretary.
169	Chester, Chester..... February 5, 1892—White.	147	{ Walter P. Tenney, Master. Mrs. Carrie L. Warren, Lect. George S. West, Secretary.
132	Chichester, Chichester..... April 16, 1888—Drake.	94	{ Mrs. Abbie W. Towle, Master. Mrs. Alice E. Sanborn, Lecturer. Mrs. Julia E. Langmaid, Sec.
165	Chocorua, Tamworth..... November 30, 1891—Towle.	67	{ Horace A. Page, Master. Mrs. Florentine Carle, Lecturer. Mrs. Lizzie F. Remick, Sec.
9	Claremont, Claremont..... November 18, 1873—Thompson.	241	{ Frank A. Fairbanks, Master. Mrs. Lestina A. Millen, Lecturer. Mrs. Anna L. Roberts, Secretary.
81	Cocheco, Dover..... February 26, 1876—Smith.	71	{ Harry L. Brewster, Master. Mrs. Elizabeth E. Knox, Lect. Mrs. Carrie E. Varney, Sec.
19	Cold River, Acworth..... February 13, 1874—Clogston.	51	{ Algene A. Fisk, Master. Mrs. Mary Chapman, Lecturer. Almon E. Clark, Secretary.
223	Colebrook, Colebrook..... February 1, 1895—White.	146	{ Warren L. Rowell, Master. Mrs. Emma Chatman, Lecturer. Mrs. Lizzie L. Whittemore, Sec.
224	Columbia, Columbia..... February 2, 1895—White.	72	{ S. A. Weeks, Master. Lucy Pinckney, Lecturer. Mrs. Angie Weeks, Secretary.
216	Contoocook, Contoocook..... December 6, 1894—Bachelder.	153	{ William L. Montgomery, Master. Robert T. Gould, Lecturer. Arthur Symonds, Secretary.
256	Coos, North Strafford..... April 22, 1897—White.	73	{ J. C. Pattee, Master. Harriet P. Clark, Lecturer. Ellen M. Magoon, Secretary.
25	Cornish, Cornish..... March 25, 1874—Chase.	94	{ Frank H. Weld, Master. Mrs. R. A. R. Barton, Lecturer. Charles S. Lear, Secretary.
164	Crescent Lake, N. Barnstead.... October 22, 1891—McDaniel.	64	{ Harry Morrison, Master. Mrs. Josie M. Foss, Lecturer. Lizzie E. Walker, Secretary.
65	Crown Point, Strafford Corner... October 11, 1875—Shaw.	140	{ E. Roscoe Evans, Master. Mrs. Mary Hall, Lecturer. Charles Tebbets, Secretary.
101	Crystal Lake, Gilmanton I. W.... September 5, 1884—Stinson.	106	{ Mrs. Aura E. Price, Master. Alma L. Smith, Lecturer. Mrs. Ora A. Thyng, Secretary.

No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
100	Daniel Webster, Webster..... February 20, 1884—Stinson.	29	{ Henry Dodge, Master. Mrs. Josephine Thompson, Lect. Mrs. Grace B. Scribner, Sec.
187	Danville, Danville..... June 30, 1892—Hutchinson.	71	{ William W. Winslow, Master. Mrs. Emma Osborne, Lecturer. Ethel Day, Secretary.
74	Deerfield, Deerfield ..... December 30, 1875—Shaw.	128	{ Wilbur H. White, Master. Mrs. Sarah C. Chase, Lecturer. Mrs. Mary A. Clark, Secretary.
282	Derry, Derry..... September 5, 1899—White.	116	{ James I. Miltimore, Master. Mrs. Sadie B. Williamson, Lect. Mrs. Annie J. Nichols, Secretary.
286	Derryfield, East Manchester..... October 27, 1899—White.	225	{ Dana M. Wilson, Master. Mrs. Mary A. Caldwell, Lect. Mrs. Agnes McKelvie, Secretary.
280	Dorchester, Dorchester..... August 22, 1899—White.	60	{ Henry M. Merrill, Master. Mrs. Lydia M. Schoolcraft, Lect. Azro H. Schoolcraft, Secretary.
225	Dover, Dover..... April 24, 1895—Wentworth.	257	{ Herbert F. Chase, Master. Mrs. Alice G. Davis, Lect. Mrs. Emma N. Steuerwald, Sec.
294	Eagle, Chatham..... March 20, 1902—Drake.	75	{ Harry M. Chandler, Master. Mrs. Elizabeth Charles, Lecturer. Susie W. Charles, Secretary.
302	East Candia, East Candia..... March 12, 1903—Hoyt.	80	{ John A. Holt, Master. Mrs. Mabel Marden, Lecturer. Mrs. Lilla I. Dearborn, Sec.
311	Eclipse, Newton..... December 7, 1908—Stevens.	70	{ Enoch H. Nichols, Master. Mrs. Annie M. Heath, Lecturer. D. Frank Battles, Secretary.
227	Eden, West Milan..... May 14, 1895—White.	75	{ H. E. Judd, Master. Mrs. Mabel Hagar, Lecturer. Mrs. Lillian B. Cole, Secretary.
281	Enterprise, Salem Depot..... September 4, 1899—White.	105	{ Albert L. Littlefield, Master. Mrs. Annie B. M. Stevens, Lect. Charles A. Stevens, Secretary.
69	Eureka, Grafton..... October 27, 1875—Royden.	169	{ Len Haskins, Master. Mrs. Minnie E. Valia, Lecturer. Henry M. Valia, Secretary.
136	Excelsior, Marlow..... December 11, 1888—White.	94	{ Walter R. Haydock, Master. Burton C. Howard, Lecturer. Mrs. Ellen A. Huntley, Secretary.
94	Ezekiel Webster, Boscawen..... March 23, 1883—Stinson.	106	{ Erwin A. Griffin, Master. Mrs. Nettie Goodhue, Lecturer. Mattie L. Hardy, Secretary.
300	Fidelity, South Hampton..... February 12, 1903—Drake.	63	{ George Walter Palmer, Master. Mrs. Sarah E. Towle, Lecturer. Mary N. Currier, Secretary.
154	Fitzwilliam, Fitzwilliam..... June 26, 1890—White.	100	{ Charles P. Bosworth, Master. Mrs. Mary Townes, Lecturer. Bertha L. Platts, Secretary.
96	Forest, Stoddard..... November 15, 1883—Stinson.		{ H. E. Spaulding, Master. Harriette Taylor, Lecturer. Myrtie M. Smith, Secretary.



No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
108	Franklin, Franklin..... December 19, 1885—Bachelder.	57	{ Arthur M. Colby, Master. Benjamin F. Sprague, Lecturer. Albert H. Manuel, Secretary.
140	Freedom, Freedom..... March 8, 1889—Bachelder.	32	{ John W. Smith, Master. Mrs. Jennie Taylor, Lecturer. Eva Mae Young, Secretary.
180	Fremont, Fremont..... March 21, 1892—White.	102	{ Alden F. Sanborn, Master. Mrs. Abbie V. Bennett, Lecturer. Mrs. Lena E. True, Secretary.
110	Friendship, Northfield..... December 26, 1885—Bachelder.	112	{ Charles S. Stevens, Master. Mrs. Sarah Smith, Lecturer. Mrs. Mabel E. Roy, Secretary.
226	Frontier, West Stewartstown..... May 11, 1895—White.	90	{ Hiram A. Schoff, Master. Allen E. Schoff, Lecturer. Mrs. Jennie Knapp, Secretary.
106	Fruitdale, Mason..... March 2, 1885—Stinson.	120	{ David S. Crockett, Master. Mrs. Lizzie G. Smith, Lecturer. Mrs. Nellie F. Amsden, Sec.
206	Garnet Hill, Center Harbor..... December 8, 1893—Towle.	54	{ Russell Lunt, Master. Mrs. Alice M. Perkins, Lect. Edith E. Leach, Secretary.
277	General Stark, W. Manchester... April 26, 1899—White.	129	{ Joseph Taylor, Master. Mrs. Edna D. Sherburne, Lect. Mrs. Alice M. Tufts, Secretary.
1	Gilman, Exeter..... August 19, 1873—Thompson.	248	{ Omer S. Rowe, Master. Mrs. Clara F. Nealley, Lect. C. Charles Hayes, Secretary.
279	Glen, Bartlett..... June 14, 1899—White.	86	{ George Hayes, Master. Amy Grant, Lecturer. Frank Burnett, Secretary.
73	Golden, Lisbon..... December 30, 1875—Boyden.	150	{ Oscar E. Clark, Master. Mrs. Carrie Kent, Lecturer. Charles W. Atwood, Secretary.
114	Golden Rod, Swanzy..... March 15, 1886—Hutchinson.	61	{ Mark Carleton, Master. L. Lowell Belding, Lecturer. Mrs. Inez A. M. Thurber, Sec.
275	Good Will, Seabrook..... March 21, 1899—Hoyt.	75	{ David Downie, Master. Mrs. Leon Oliver, Lecturer. Annie M. Perkins, Secretary.
60	Grafton Star, Hanover..... June 19, 1875—Boyden.	223	{ Herbert H. Kew, Master. Mrs. Dora E. Gauthier, Lecturer. Mrs. Nettie J. Cassin, Secretary.
7	Granite, Milford..... October 24, 1873—Thompson.	313	{ Ernest C. Brooks, Master. Mary E. Wheeler, Lecturer. Mrs. Ida M. Ritchie, Secretary.
115	Granite Lake, Nelson..... August 26, 1886—Hutchinson.	47	{ Wm. S. Mansfield, Master. Mrs. Rose M. Barker, Lecturer. Mrs. Susie A. McClure, Sec.
149	Granite State, South Kingston... March 13, 1890—Bachelder.	38	{ Mrs. Rosa Gurney, Master. Mrs. Alice Buswell, Lecturer. No election.
138	Great Meadow, Westmoreland.... January 22, 1889—White.	114	{ Glenn E. Britton, Master. Mary MacDonald, Lecturer. Mrs. Jennie L. B. Craig, Sec.

No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
23	Greenfield, Greenfield..... March 4, 1874—Shaw.	69	{ Nathaniel F. Cheever, Master. Persis A. Aiken, Lecturer. Mrs. Jennie M. Hopkins, Sec.
195	Greenland, Greenland..... December 16, 1892—White.	48	{ Charles F. Marden, Master. Charles H. Brackett, Lecturer. Irving Rolston, Secretary.
278	Greenville, Greenville..... June 5, 1899—White.	63	{ Percy W. Price, Master. Bertha M. Greene, Lecturer. Mrs. Martha A. Kimball, Sec.
255	Groveton, Groveton..... April 19, 1897—White.	149	{ George Ware, Master. Mrs. Cora Hayes, Lecturer. J. A. Martin, Secretary.
287	Halestown, East Weare..... November 16, 1899—White.	85	{ George B. LaBonta, Master. Hattie S. Esterbrooks, Lecturer. J. Charles Weatherbee, Sec.
163	Hampstead, Hampstead..... May 4, 1891—Bachelder.	165	{ George M. Titcomb, Master. Lynn V. Farnsworth, Lecturer. Mrs. Anna E. Emerson, Sec.
171	Hampton Falls, Hampton Falls.. February 16, 1892—White.	63	{ Arthur W. Chase, Master. Mrs. Hannah B. Merrill, Lect. David F. Batchelder, Secretary.
99	Harmony, Sanbornton..... December 11, 1883—Stinson.	79	{ Carl E. Hanson, Master. Eva M. Sanborn, Lecturer. Charles W. Colby, Secretary.
212	Haverhill, Haverhill..... March 28, 1894—White.	90	{ W. H. Blaisdell, Master. Mrs. Kate C. Cass, Lecturer. Mrs. Bertha C. Wells, Secretary.
205	Henry Wilson, Farmington..... November 29, 1893—Wentworth.	141	{ Lucia A. Gordon, Master. Hattie D. Watson, Lecturer. Mrs. M. E. W. Colomy, Sec.
88	Highland Lake, East Andover... December 14, 1876—F. S. Taylor	107	{ Ara N. Loveren, Master. Stella T. Thompson, Lecturer. Mrs. Grace E. Kilburn, Sec.
274	Hillsborough, Hillsborough..... March 1, 1899—Hadley.	38	{ Joseph R. Nelson, Master. Gertrude F. Carter, Lecturer. Mattie E. Blood, Secretary.
174	Hillside, Eaton..... February 29, 1892—Towle.	30	{ Fred E. White, Master. Mrs. Cora White, Lecturer. Charles M. Stanley, Secretary.
194	Hiram R. Roberts, Rollinsford.. December 19, 1892—Wentworth.	146	{ Albert C. Wentworth, Master. J. Harry Roberts, Lecturer. Ernest R. Roberts, Secretary.
12	Hollis, Hollis..... December 15, 1873—Thompson.	168	{ Charles P. Brown, Master. Mrs. Emma M. Greenleaf, Lect. Mrs. Addie L. Hale, Secretary.
153	Honor Bright, East Sullivan..... May 20, 1890—White.	95	{ Lyman Davis, Master. Grace M. Barker, Lecturer. Mrs. Alice M. Rugg, Secretary.
148	Hooksett, Hooksett..... February 28, 1890—Bachelder.	202	{ Harry N. Blake, Master. Laura M. Keating, Lecturer. Warren C. Saltmarsh, Secretary.
11	Hudson, Hudson..... December 8, 1873—Thompson.	256	{ Arthur S. Andrews, Master. Mrs. Edith G. Russell, Lecturer. Wilbur S. Blood, Secretary.

No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
270	Independence, North Groton..... July 2, 1898—White.	23	{ John N. Kinne, Master. Mrs. Abbie A. Wheel, Lecturer. Lena G. Kidder, Secretary.
72	Indian River, Canaan..... December 10, 1875—Boyd.	159	{ William F. Colesworthy, Master. Frank B. Clarke, Lecturer. Mrs. Ola M. Wilson, Secretary.
135	Jaffrey, Jaffrey..... October 8, 1888—White.	115	{ Fred W. Moore, Master. George H. Duncan, Lecturer. Mrs. Vinia S. Mower, Secretary.
161	Jeremiah Smith, Lee..... February 20, 1891—Wentworth.	73	{ Albert B. Dudley, Master. Mrs. A. Flora Davis, Lecturer. Fred P. Comings, Secretary.
53	Joe English, New Boston..... March 5, 1875—Shaw.	102	{ Norman W. Horton, Master. Almond J. Davis, Lecturer. Elsie G. Warren, Secretary.
33	John Hancock, Hancock..... July 2, 1874—Shaw.	134	{ Wilfred M. Davis, Master. Florence A. Davis, Lecturer. Bertha A. Clark, Secretary.
150	Junior, Grasmere..... March 24, 1890—McDaniel.	143	{ Mrs. Annie R. Paige, Master. Mrs. Lizzie Greer, Lecturer. Bert D. Paige, Secretary.
87	Kearsarge, Wilmot..... December 2, 1876—F. L. Taylor	69	{ Mrs. Jennie F. Emons, Master. Mrs. Mary Walker, Lecturer. Mrs. Mary E. Roby, Secretary.
172	Keeneborough, Brentwood..... February 19, 1892—White.	96	{ Nathan B. Abbott, Master. Mrs. Sadie E. James, Lecturer. Mrs. Clara A. Abbott, Secretary.
173	Kensington, Kensington..... February 23, 1892—White.	99	{ Melvin Armstrong, Master. Lizzie E. Tuck, Lecturer. George A. Prescott, Secretary.
177	Kingston, Kingston..... March 11, 1892—White.	34	{ H. L. Sweeney, Master. Mrs. M. A. Tuck, Lecturer. G. B. Stevens, Secretary.
120	Laconia, Laconia..... March 9, 1887—Hutchinson.	141	{ Isaac W. Trojano, Master. Mrs. Carrie B. Sanborn, Lect. Mrs. Mary C. Hall, Secretary.
268	Lafayette, Franconia..... January 25, 1894—White.	108	{ James Callahan, Master. Mrs. Una Bowles, Lecturer. Mrs. Julia M. Jesseman, Sec.
221	Lake, Sunapee..... January 7, 1895—Graves.	125	{ Charles F. Morgan, Master. Mrs. Margaret J. Morgan, Lect. Effie L. Gardner, Secretary.
128	Lake Shore, Wolfeboro..... February 8, 1888—Bachelder.	159	{ Charles F. Tyler, Master. Mrs. Bertha M. Young, Lect. Mrs. Clara F. Burleigh, Sec.
240	Lamprey River, Newmarket..... February 26, 1896—Wentworth.	89	{ Mrs. Edith M. Haines, Master. Mrs. Mary B. Mathes, Lecturer. S. Cassell Burell, Secretary.
48	Lancaster, Lancaster..... February 12, 1875—Richardson.	110	{ Orrin E. Wentworth, Master. Mrs. Ella J. Hartford, Lecturer. W. R. Stockwell, Secretary.
117	Lawrence, Belmont..... February 1, 1887—Bachelder.	175	{ Mrs. Lillian K. Gilman, Master. Mrs. Myrtie V. Bickford, Lect. Mrs. Etta B. Dearborn, Sec.

No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
126	Lebanon, Lebanon..... January 9, 1888—McDaniel.	279	{ Mrs. Clara A. Bryant, Master. Clara A. Gates, Lecturer. Fred E. Buck, Secretary.
192	Lewis W. Nute, Milton..... December 16, 1892—Wentworth.	46	{ Mrs. Annie O. Willey, Master. Mrs. Cora A. Hodgdon, Lecturer. Laura H. Williams, Secretary.
307	Liberty, Plaistow..... June 4, 1908—Stevens.	59	{ William H. Freke, Master. Joseph S. Hills, Lecturer. Mary E. Towle, Secretary.
159	Lincoln, West Swanzey..... December 30, 1890—Rockwood.	82	{ Mrs. Nellie Perham, Master. Mrs. Francis Pickett, Lecturer. Carl R. Ramsdell, Secretary.
44	Londonderry, Londonderry..... January 18, 1875—DeRochment.	156	{ Eugene P. Peabody, Master. Mrs. Cordelia Parmenter, Lect. William H. Crowell, Secretary.
273	Loudon Center, Loudon Center... February 25, 1899—Bachelder.	53	{ William Carroll, Master. Mrs. Alice L. Lane, Lecturer. Calvin F. Lane, Secretary.
121	Loudon Surprise, Loudon..... March 9, 1887—Bachelder.	74	{ Arthur N. Brown, Master. Mrs. Alice E. Langley, Lecturer. Frank A. Brown, Secretary.
5	Lovell, Washington..... October 3, 1872—Thompson.	47	{ J. H. Otterson, Master. Mrs. Carrie B. Ball, Lecturer. Albert T. Wright, Secretary.
178	Lovell Union, Wakefield..... February 11, 1892—Towle.	107	{ Mrs. Carrie B. Lang, Master. Mrs. Annie H. Paul, Lecturer. Mrs. Rosa Robinson, Secretary.
237	Lyman, Lyman..... January 17, 1896—White.	91	{ H. H. Stevens, Master. Christie Lynde, Lecturer. Wilmer Langway, Secretary.
118	Marlboro, Marlboro..... February 16, 1887—Hutchinson.	141	{ Leon E. Smith, Master. Helen H. Wiswall, Lecturer. Mrs. Nettie E. Richardson, Sec.
134	Marshall P. Wilder, East Rindge September 25, 1888—White.	53	{ Mrs. Emma F. Barrett, Master. Lila S. Wellington, Lecturer. Mrs. Elizabeth M. Todd, Sec.
68	Mascoma, West Canaan..... October 26, 1875—Boyden.	119	{ Cyé Dennis, Master. Wm. Woodley, Lecturer. H. L. Webster, Secretary.
220	Mascot, Gorham..... December 28, 1894—White.	46	{ Thomas Haley, Master. A. W. McLaughlin, Lecturer. Mrs. R. J. Esterbrook, Sec.
127	Massabesic, Auburn..... January 18, 1888—Bachelder.	67	{ John P. Griffin, Master. Mrs. Sarah J. Hall, Lecturer. Fred H. Hall, Secretary.
297	Mayflower, North Londonderry... May 7, 1902—Drake.	80	{ Elmer F. Wheeler, Master. Pearl A. Reid, Lecturer. Mrs. Minnie M. Goodwin, Sec.
192	McClary, Epsom..... October 10, 1884—Drake.	176	{ Benjamin M. Towle, Master. Mrs. Lizzie F. Fowler, Lect. Mrs. Annie M. Fowler, Secretary.
151	Meriden, Meriden..... April 23, 1890—McDaniel.	57	{ Fred A. Rogers, Master. Mrs. Nellie M. Andrews, Lect. Nathan R. Andrews, Secretary.

No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
4	Merrimack River, Canterbury.... September 15, 1873—Thompson.	43	{ Howard Chute, Master. Mrs. Ida S. Chase, Lecturer. Frank H. Merrill, Secretary.
155	Merry Meeting, Alton..... October 23, 1890—Hunt.	131	{ Melvin Adams, Master. Mrs. Effie M. McDuffee, Lect. John H. McDuffee, Secretary.
34	Miller, Temple..... August 29, 1874—Shaw.	64	{ Frank E. Cutter, Master. George B. Sherwin, Lecturer. D. C. Bragdon, Secretary.
192	M. L. Ware, West Rindge..... December 16, 1892—White.	100	{ Arthur E. Taggart, Master. Mrs. Elizabeth S. Wetherbee, Lect. Jennie M. Thomas, Secretary.
217	Mohawk, Colebrook..... December 16, 1892—White.	78	{ Henry A. Hodge, Master. Nina Jordan, Lecturer. I. C. Woodrow, Secretary.
103	Monadnock, Dublin..... October 14, 1884—Stinson.	123	{ Arthur E. Wright, Master. Mrs. Mabel J. Fiske, Lecturer. Wilfred M. Fiske, Secretary.
49	Monroe, Monroe..... February 18, 1875—Richardson.	83	{ Robert S. Beattie, Master. D. R. Gilchrist, Lecturer. Mrs. W. E. Emery, Secretary.
70	Mont Calm, Enfield..... December 7, 1875—Boyden.	114	{ Ernest O. Bailey, Master. Mrs. Ella F. Dresser, Lecturer. Val M. Clough, Secretary.
214	Moosilauke, East Haverhill..... May 22, 1892—White.	89	{ F. J. Bemis, Master. Bertha Allen, Lecturer. E. H. Smith, Secretary.
62	Morning Star, Lyme..... June 24, 1875—Boyden.	133	{ Earl C. Perkins, Master. Mrs. Lucinda D. Amsden, Lect. Mrs. Susan C. Elliott, Secretary.
197	Moultonborough, Moultonborough January 23, 1893—Towle.	65	{ Fred P. Richardson, Master. Herbert A. Richardson, Lect. Maude L. Tilton, Secretary.
215	Mountain Laurel, Northwood..... June 9, 1894—Wentworth.	75	{ Samuel W. Gerrish, Master. Charlotte M. M. Foye, Lect. Alice L. Chesley, Secretary.
305	Mountain View, East Conway.... December 27, 1906—Drake.	38	{ Eben I. Flint, Master. Mary E. Woodward, Lecturer. Mrs. Minnie F. Woodward, Sec.
246	Mount Duston, Wentworth's Loc. June 10, 1896—White.	39	{ Lewis H. Coy, Master. Allora L. Flint, Lecturer. Claude Linnell, Secretary.
218	Mount Gardner, Woodsville..... December 15, 1894—White.	33	{ W. W. Chamberlin, Master. Mrs. Jennie C. Franklin, Lect. Mrs. Ellen C. Flanders, Sec.
77	Mount Hope, Landaff..... January 31, 1876—Child.	75	{ Fred W. Lynde, Master. Mrs. Harry Poore, Lecturer. Ralph Heath, Secretary.
158	Mount Israel, Sandwich..... December 22, 1890—Bachelder.	100	{ A. B. Hoag, Master. Ella Weeks, Lecturer. Mrs. A. B. Hoag, Secretary.
242	Mount Prospect, Lancaster..... March 13, 1896—White.	176	{ J. E. McIntire, Master. Mrs. Lillian Chase, Lecturer. Mrs. Elva A. Nourse, Secretary.



No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
116	Mount Washington, Whitefield... December 13, 1886—Hutchinson.	103	{ John T. Twombly, Jr., Master. Mrs. Ada Twombly, Lecturer. Mrs. Lillian B. Elliott, Sec.
52	Mt. Belknap, Gilford..... March 1, 1875—Shaw.	87	{ Howard M. James, Master. Mrs. Lizzie A. James, Lecturer. Mrs. Addie L. Eaton, Secretary.
236	Mt. Cube, Orford..... December 30, 1895—White.	64	{ Walter A. Horton, Master. Mrs. Frances B. Morrison, Lect. Mrs. Minnie W. Cushman, Sec.
288	Mt. Livermore, Holderness..... November 13, 1899—Hoyt.	88	{ Mrs. Florence E. George, Master. Agnes M. Rogers, Lecturer. Fred W. George, Secretary.
310	Mt. Major, West Alton..... May 12, 1909—Drake.	30	{ Charles A. Rollins, Master. Mrs. Grace H. Rollins, Lect. Mrs. Lillie A. Rollins, Sec.
145	Mt. Pistareen, Spofford..... December 11, 1899—White.	84	{ A. H. Post, Master. Mrs. Etta M. Tuttle, Lecturer. F. C. Hamilton, Secretary.
46	Narragansett, Bedford..... January 16, 1875—Shaw.	191	{ George Gookin, Master. William H. Shaw, Lecturer. Mrs. Mary A. Gove, Secretary.
13	Nashua, Nashua..... December 16, 1873—Thompson.	262	{ Frank Porteous, Master. Mrs. Lena S. Francis, Lecturer. Mrs. Mary F. Sprague, Sec.
241	Naumkeag, Litchfield..... March 17, 1896—Ryder.	67	{ James Hopwood, Master. Bertha E. Crowell, Lecturer. Lizzie B. McQuesten, Secretary.
262	New Durham, New Durham..... October 26, 1897—White.	76	{ Mrs. Edith A. Lamberton, Mas. Mrs. Carrie A. Burnham, Lect. Mrs. Sarah E. Coburn, Sec.
162	Newfound Lake, Bristol..... March 17, 1891—Hutchinson.	240	{ Mrs. Helen A. Hopkins, Master. Mrs. Margaret Gray, Lecturer. Mrs. Emma McMurphy, Sec.
123	New* Hampton, New Hampton.... April 22, 1887—Hutchinson.	126	{ Hadley B. Worthen, Master. Herbert M. Thyng, Lecturer. Ruth M. Flanders, Secretary.
95	New London, New London..... October 25, 1883—Stinson.	141	{ Wilbur C. Knowlton, Master. Ethel C. Williams, Lecturer. Ira S. Littlefield, Secretary.
250	North Hampton, North Hampton... January 5, 1897—Towle.	116	{ Percy E. Jewel, Master. Albert E. Locke, Lecturer. Carita J. Knowles, Secretary.
27	North Star, Stewartstown..... March 30, 1874—Shaw.	104	{ Frank Blodgett, Master. Mrs. Nora J. Reney, Lecturer. George H. Carr, Secretary.
209	Northwood, Northwood Narrows... February 5, 1894—White.	76	{ Joseph D. Piper, Master. Mrs. Mary B. Whiting, Lecturer. Clara L. Emerson, Secretary.
27	Nutfield, Derry..... September 23, 1874—DeRochment	86	{ Mrs. Emma C. Lane, Master. Mrs. Winnie Norton, Lecturer. Mrs. Lizzie F. Hill, Secretary.
32	Oak Hill, Francestown..... June 16, 1874—Shaw.	75	{ Rodney G. Mills, Master. Mrs. Rosa T. Prescott, Lect. Mrs. Cora Wood Patch, Sec.

No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
260	Ocean Side, Hampton..... October 2, 1897—White.	105	{ Edward J. Brown, Master. Charles O. Stickney, Lecturer. Mrs. Lillian Roberts, Secretary.
79	Olive Branch, Hebron..... February 17, 1876—Shaw.	57	{ Frank O. Morse, Master. Mrs. Alma C. Morse, Lecturer. Mary A. Rogers, Secretary.
296	Osceola, Campton Village..... March 26, 1902—Hoyt.	88	{ Mrs. Addie L. Ronan, Master. Orra Osgood, Lecturer. Mrs. Sara A. Cheney, Secretary.
175	Ossipee Lake, Ossipee..... February 26, 1892—Towle.	82	{ Elmer Loring, Master. Mrs. Annie E. Merrow, Lect. Zaidee E. Hurn, Secretary.
130	Ossipee Mountain, Ossipee..... March 19, 1888—Bachelder.	65	{ Charles A. Wiggin, Master. Mrs. Ella F. Beane, Lecturer. Mrs. Addie E. Ham, Secretary.
249	Park, Cornish Flat..... August 29, 1896—Fitch.	81	{ George L. Deming, Master. Mrs. Gertrude E. Cole, Lect. Mrs. Lucy C. Weld, Secretary.
299	Parker Mountain, Center Strafford February 11, 1903—Drake.	79	{ Fred W. Roberts, Master. Mrs. Addie R. Foss, Lecturer. Mrs. Annie B. Foss, Secretary.
266	Pasquaney, Bridgewater..... January 13, 1898—White.	30	{ Melverton Hill, Master. Marvin Lockwood, Lecturer. Mrs. Flora D. Snow, Secretary.
166	Patuccoway, Nottingham..... December 22, 1891—Towle.	67	{ Sewell A. Watson, Master. Mrs. M. Lizzie Watson, Lecturer. Maria E. Kelsey, Secretary.
269	Peaked Hill, Gilmanton..... January 17, 1898—White.	69	{ John H. Beck, Master. Mrs. Florence E. Sanderson, Lect. Mrs. Arabelle Z. Knowles, Sec.
244	Pelham, Pelham..... April 14, 1896—Ryder.	188	{ Daniel G. B. Burns, Master. Mrs. Estelle F. Hyde, Lecturer. Mary E. Hobbs, Secretary.
111	Pembroke, Pembroke..... December 30, 1885—Stinson.	211	{ Burt D. Robinson, Master. Mrs. Margaret S. Dunham, Lect. Mrs. Julia A. Eaton, Secretary.
184	Penacook Park, West Concord... April 26, 1892—Bachelder.	179	{ Sherman H. Murray, Master. Mrs. Mary L. Farnum, Lecturer. Mrs. Annie F. Harrington, Sec.
146	Pequawket, North Conway..... December 23, 1889—Bachelder.	151	{ Howard B. Heard, Master. Mrs. Janette M. Pendexter, Lect. Martha Lewis, Secretary.
35	Peterborough, Peterborough.... September 5, 1874—Shaw.	193	{ Albert O. Frost, Master. Mrs. Hattie C. Ames, Lecturer. Bertha M. Hadley, Secretary.
219	Piermont, Piermont..... December 17, 1894—White.	117	{ Frank F. Worthen, Master. Caleb O. French, Lecturer. Mrs. Addie C. Blair, Secretary.
291	Pike Station, Pike..... November 14, 1900—Baker.	82	{ Mrs. Nancy Morrill, Master. Mrs. Claribel P. Gregory, Lect. Margurite Brownlee, Secretary.
229	Pilot, Stark..... June 19, 1895—White.	107	{ Charles A. Cole, Master. Mrs. Bertha Kimball, Lecturer. Owen H. Astle, Secretary.

No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
298	Pine Grove, Bath..... January 2, 1903—Hoyt.	95	Hugh E. Poor, Master. Mary L. Woods, Lecturer. Mrs. Annie B. Kentfield, Sec.
210	Pink Granite, North Haverhill... February 12, 1894—White.	124	John E. Eastman, Master. Mrs. Luella Kimball, Lecturer. Mrs. Cora M. Eastman, Sec.
18	Pinnacle, Lyndeborough..... December 26, 1873—Shaw.	90	John A. Spaulding, Master. Mrs. Jennie E. Tirrill, Lect. Frank O. Baxter, Secretary.
179	Piscassic, Newfields..... March 17, 1892—White.	59	Charles F. Neal, Master. Daniel R. Smith, Lecturer. Mrs. Lavinia J. Doe, Secretary.
176	Piscataqua, Newington..... March 4, 1892—Bachelder.	40	Frederick Pickering, Master. Mrs. Mary S. Hoyt, Lecturer. Mrs. Edith G. Hoyt, Secretary.
272	Pleasant Valley, Milton Mills.... February 1, 1899—Hoyt.	67	Mrs. Lucia Plummer Fox, Mas. Helen G. Fox, Lecturer. Mrs. Florence N. Hanson, Sec.
239	Plymouth, Plymouth..... January 30, 1896—Baker.	131	Iza J. Smith, Master. Mrs. Stella F. Milligan, Lect. W. H. Daniell, Secretary.
257	Prentice Hill, East Alstead..... June 5, 1897—White.	83	Arthur E. Wilder, Master. Mrs. Augusta Riordan, Lecturer. George A. Mayo, Secretary.
259	Profile, North Woodstock..... September 17, 1897—White.	65	F. P. Willoughby, Master. Marion Boothe, Lecturer. Mrs. Myrtle E. Putnam, Sec.
171	Progressive, Deerfield..... January 3, 1899—Hoyt.	87	Luther W. Young, Master. Mary E. Messer, Lecturer. Charles R. Brown, Secretary.
21	Prospect, Mont Vernon..... February 28, 1874—Shaw.	83	William S. Stinson, Master. John E. Corliss, Lecturer. William P. Jenkins, Secretary.
168	Purling Beck, East Washington... May 28, 1898—White.	65	Bertram H. Nichols, Master. Mrs. Elma L. Hixson, Lecturer. C. W. Fletcher, Secretary.
213	Raymond, Raymond..... May 3, 1894—Hill.	151	Ivan Morrison, Master. Mrs. Amelia F. Smith, Lecturer. James M. Healey, Secretary.
206	Reliance, North Salem..... November 19, 1907—Drake.	29	James A. Reed, Master. Mrs. Martha Jennings, Lecturer. Seth M. Pattee, Secretary.
303	Reunion, Middleton..... February 1, 1906—Drake.	53	George H. Cook, Master. Mrs. Mattie A. Orne, Lecturer. Mrs. Olivette T. Leighton, Sec.
147	Richmond, Richmond..... January 16, 1890—White.	86	Mrs. Nellie H. Prescott, Master. Mary A. Bullock, Lecturer. Mrs. Cora F. Martin, Secretary.
293	Riverdale, Riverdale..... February 13, 1902—Drake.	58	J. F. Nichols, Master. Mrs. Ida A. Whipple, Lecturer. Mrs. May F. Bixby, Secretary.
137	Riverside, Dalton..... December 31, 1888—Harriman.	95	William O. Emerson, Master. Mrs. Mary Britton, Lecturer. Mrs. Etta Whitcomb, Secretary.

No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
36	Rochester, Rochester..... May 30, 1876—Chase.	327	{ Ernest W. Bickford, Master. Mrs. Bessie B. Torr, Lecturer. Mrs. Lillian B. Folsom, Sec.
183	Rockingham, Epping..... March 21, 1892—Towle.	103	{ James A. Leddy, Master. Daniel Slattery, Lecturer. Mrs. Lora J. Cate, Secretary.
284	Rockland, George's Mills..... October 11, 1899—Gay.	70	{ Fred L. Bartlett, Master. Mildred A. Bartlett, Lecturer. Charles L. Russell, Secretary.
109	Rumford, East Concord..... December 21, 1885—Stinson.	138	{ Harold D. Merrill, Master. Joie Bachelder, Lecturer. Frank P. Curtis, Secretary.
158	Rumney, Rumney..... September 19, 1892—Hutchinson.	151	{ George D. Kidder, Master. Mrs. J. B. Foster, Lecturer. Etta C. Pease, Secretary.
233	Rye, Rye..... December 6, 1895—Bachelder.	111	{ Wilmot M. Smart, Master. Mrs. Ariadne Walker, Lecturer. Mrs. Clara O. Walker, Secretary.
285	Saco Valley, Center Conway..... October 30, 1899—Hoyt.	51	{ W. R. Burnell, Master. Mrs. A. M. D. Blouin, Lecturer. John F. Stott, Secretary.
168	Salem, Salem..... February 3, 1892—White.	133	{ Harold P. Haigh, Master. Emma F. Coburn, Lecturer. Mrs. Susan A. Cluff, Secretary.
181	Sandown, Sandown..... March 24, 1892—White.	78	{ Ernest W. Nye, Master. Mrs. Nellie C. Sanborn, Lect. Elwin C. Mills, Secretary.
122	Scammell, Durham..... March 16, 1887—Stanton.	105	{ John C. McNutt, Master. Florence Pendexter, Lecturer. Harrie E. Rand, Secretary.
105	Silver Lake, Harrisville..... December 13, 1884—Hutchinson.	73	{ Mrs. Hattie L. Russell, Master. Bernard F. Bemis, Lecturer. Mrs. Bertha C. Bemis, Secretary.
196	Silver Mountain, Lempster..... December 23, 1892—Graves.	109	{ Orson P. Nichols, Master. Mrs. L. May Wheeler, Lecturer. Mrs. Susie B. Hurd, Secretary.
264	Somersworth, Somersworth..... November 24, 1897—Wentworth.	79	{ Sumner C. Horn, Master. Mrs. Harry J. Wentworth, Lect. Mabel Walsh, Secretary.
10	Souhegan, Amherst..... December 5, 1873—Thompson.	189	{ Harry E. Heath, Master. Mrs. Lestina A. Holbrook, Lect. Ruth E. Lewis, Secretary.
83	Spafford, West Chesterfield..... April 11, 1876—Shaw.	90	{ Perley A. Richardson, Master. Mrs. Nellie A. Williams, Lect. Ransom C. Farr, Secretary.
253	Squam Lake, Ashland..... September 14, 1897—White.	158	{ Frank H. Kimball, Master. Mrs. Amelia A. Nichols, Lect. Roxey J. Heath, Secretary.
42	Stark, Dunbarton..... October 30, 1874—Shaw.	124	{ David M. Hadley, Master. Ethel C. Stone, Lecturer. Walter C. Walker, Secretary.
124	Starr King, Jefferson..... October 11, 1887—Hutchinson.	103	{ Uriah Hayes, Master. Nellie L. Muzzey, Lecturer. Mrs. Josie L. Kenison, Secretary.

No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
238	Stratford, Stratford..... January 27, 1896—White.	39	John N. Connary, Master. Effie Atherton, Lecturer. Frank Mason, Secretary.
251	Strawberry Bank, Portsmouth... January 29, 1897—Towle.	240	Amon O. Benfield, Master. Mrs. Louise Smallcon, Lecturer. Lizzie M. Currier, Secretary.
222	Sugar Hill, Sugar Hill..... January 19, 1895—White.	126	Daniel M. Tefft, Master. Mrs. Gertrude C. Bowles, Lect. Mrs. May P. Bowles, Secretary.
190	Sugar River, North Charlestown. November 12, 1892—Graves.	50	Edmund Johnson, Master. Mrs. Elizabeth Lane, Lecturer. Herman J. Lane, Secretary.
8	Sullivan, Newport..... November 7, 1873—Thompson.	157	Ada R. Tenney, Master. Mrs. Erminnie E. Colby, Lect. Mrs. Etta F. Gove, Secretary.
112	Sunapee Lake, Newbury..... January 8, 1886—Stinson.	136	James C. Farmer, Master. Mrs. Jennie E. Folsom, Lecturer. John D. Peaslee, Secretary.
144	Sunapee Mountain, Goshen..... November 29, 1889—Cutts.	134	Richard C. Graves, Master. Mrs. Julia M. Crane, Lecturer. Mrs. Lillian A. Jones, Secretary.
156	Surry, Surry..... November 11, 1890—Hutchinson.	43	Hiram F. Newell, Master. Mrs. Lilla C. Newell, Lecturer. Hollis W. Harvey, Secretary.
91	Sutton, Sutton..... October 13, 1877—Taylor.	82	Carl W. Hurd, Master. Mrs. Elizabeth A. Prescott, Lect. Mrs. Rozina E. Kelley, Sec.
248	The Weirs, The Weirs..... August 13, 1896—White.	76	Fred C. True, Master. John C. Dow, Lecturer. Mrs. Minnie M. Avery, Secretary.
31	Thornton, Merrimack..... May 18, 1874—Shaw.	193	Frank H. Corning, Master. Mrs. Marguerite Henderson, Lect. Minnie S. Corning, Secretary.
304	Tripeak, Hill..... November 8, 1906—Drake.	41	Fred H. Gage, Master. Mrs. F. H. Gage, Lecturer. Angelo H. Fowler, Secretary.
157	Trojan, Troy..... December 13, 1890—White.	71	Mrs. L. Estella Buckwold, Mas. Mrs. M. Alice Haskell, Lect. Mrs. Ida M. Hutt, Secretary.
142	Tuftonborough, Tuftonborough... November 15, 1889—Bachelder.	102	Mrs. Mary F. Lamprey, Master. Edwin B. Edgerly, Lecturer. Mrs. Josie E. Young, Secretary.
231	Umbagog, Errol..... November 8, 1895—White.	73	Ray R. Hanscom, Master. S. R. Hanscom, Lecturer. L. C. Bragg, Secretary.
40	Uncanoonuc, Goffstown..... October 29, 1874—Shaw.	187	Will P. Hadley, Master. Alzira E. Gregg, Lecturer. Mrs. Georgia F. Martin, Sec.
230	Unity, Unity..... October 29, 1895—Bachelder.	142	Arlyn E. Peck, Master. Mrs. Gertrude Thrasher, Lect. Mrs. Carrie E. Reed, Secretary.
63	Valley, Hillsborough..... June 26, 1875—Shaw.	87	Alton C. Colby, Master. Mary N. Barnes, Lecturer. Mrs. Mabel A. Crosby, Secretary.



No.	NAME, LOCATION, TIME AND BY WHOM ORGANIZED.	No. of Mem- bers.	OFFICERS.
125	Walpole, Walpole ..... December 15, 1887—Hutchinson.	155	{ Clarence Houghton, Master. Mrs. Eva Stowell, Lecturer. George L. Houghton, Secretary.
133	Wantastiquet, Hinsdale..... July 27, 1888—H. G. Smith.	93	{ Gustavus S. Smith, Master. Mrs. Janette L. Davis, Lecturer. Harold S. Martin, Secretary.
90	Warner, Warner..... April 9, 1877—Shaw.	208	{ Fred A. Sawyer, Master. Abigail L. Dunbar, Lecturer. Arthur M. Tucker, Secretary.
200	Warren, Warren..... February 11, 1893—White.	103	{ Frank Wright, Master. Mrs. Sarah A. Pease, Lecturer. Charles A. Arnold, Secretary.
47	Warren Pond, Alstead..... February 2, 1875—J. H. Clark.	88	{ Leon M. Trow, Master. Mrs. Annie D. Washburn, Lect. Mrs. Belle H. Trow, Secretary.
36	Watatic, New Ipswich..... September 11, 1874—Shaw.	88	{ Fred L. Mansfield, Master. Isham E. Aldrich, Lecturer. Mrs. Maria A. Jaquith, Sec.
276	Weare, North Weare..... April 4, 1899—Hadley.	142	{ Bernard Gunn, Jr., Master. Carroll W. Farr, Lecturer. Mrs. A. Lou Breed, Secretary.
199	Wentworth, Wentworth..... February 10, 1893—White.	176	{ Charles H. Brown, Master. Mrs. Carrie M. Johnson, Lect. Allan F. Downing, Secretary.
253	West Thornton, Thornton..... April 8, 1897—White.	81	{ A. C. Kinsman, Master. Mrs. Affie R. Merrill, Lecturer. Anna L. Kendall, Secretary.
50	White Mountain, Littleton..... February 19, 1875—Richardson.	190	{ Frank P. Cheney, Master. Edith Richardson, Lecturer. Albert L. Farr, Secretary.
292	Wicwas Lake, Meredith Center.. October 19, 1901—Hoyt.	54	{ Joseph F. Smith, Jr., Master. Mrs. F. J. Smith, Lecturer. Mrs. Eva M. Brown, Secretary.
182	Windham, Windham..... March 29, 1892—White.	47	{ Edward A. Haskell, Master. Mrs. Grace R. Proctor, Lecturer. Mrs. M. J. H. Berry, Secretary.
308	Wingold, East Kingston..... February 26, 1909—Stevens.	68	{ Archibald L. Mackie, Master. Mrs. Annie M. Buswell, Lect. George H. Smith, Secretary.
170	Winnicutt, Stratham..... February 13, 1892—White.	63	{ Gilbert A. Smith, Master. Mrs. J. P. Clare, Lecturer. George L. Barker, Secretary.
51	Winnepesaukee, Meredith..... March 2, 1875—Shaw.	214	{ Freeman G. Smith, Master. Samuel A. Burleigh, Lecturer. Bernice Wilcox, Secretary.
198	Winnisquam, East Tilton..... February 6, 1893—Bachelder.	82	{ R. I. Blaisdell, Master. Nelson H. Earle, Lecturer. H. A. Jewett, Secretary.
41	Wolf Hill, Deering..... October 29, 1874—Shaw.	59	{ Harland C. Smith, Master. Mrs. Lizzie M. Thomas, Lecturer. Eva S. Dutton, Secretary.
54	Wyoming, South Weare..... March 23, 1875—Shaw.	69	{ Albert S. Farmer, Master. Forrest Dearborn, Lecturer. Mrs. Eliza M. Colburn, Sec.
309	Wilmot, Wilmot..... March 12, 1909—Hadley.	36	{ Austin E. Langley, Master. Mrs. Florence L. Goodhue, Lect. Herbert L. Woodward, Secretary.



REPORT

OF THE

N. H. HORTICULTURAL SOCIETY

## LETTER OF TRANSMITTAL.

---

*Hon. N. J. Bachelder, Secretary of the State Board of Agriculture, Concord, N. H.:*

DEAR SIR:—I have the honor to transmit to you herewith the fourth annual report of the New Hampshire Horticultural Society, being the report of its sixteenth annual meeting and exhibition, held at Manchester, N. H., October 20, 21, 22, 1910.

Yours respectfully,

B. S. PICKETT,

*Secretary.*

## OFFICERS AND MEMBERSHIP.

---

### OFFICERS FOR 1911.

*President*, C. C. SHAW, Milford.

*Vice-President*, J. T. HARVEY, Pittsfield.

*Secretary*, B. S. PICKETT, Durham.

*Treasurer*, T. E. HUNT, Meredith.

### EXECUTIVE COMMITTEE.

THE OFFICERS AND  
C. W. BARKER,

E. B. PARKER,  
F. A. BADGER.

### DIRECTORS.

Rockingham county, C. W. Barker, Exeter.

Belknap county, F. A. Badger, Belmont.

Hillsborough county, E. B. Parker, Wilton.

Carroll county, D. R. Slade, Center Harbor.

Merrimack county, E. N. Sawyer, Salisbury.

Cheshire county, Sidney C. Ellis, Keene.

Grafton county, W. D. Baker, Quincy.

Coös county, J. A. Costello, Lancaster.

Strafford county, A. I. Hall, Rochester.

Sullivan county,

### MEMBERSHIP.

All persons interested in horticulture are eligible to membership.



Annual membership fee	.	.	.	.	\$1.00
Life membership fee	.	.	.	.	10.00

Fees should be remitted to the secretary.

For further information regarding the exhibition and for premium lists, write the secretary,

B. S. PICKETT, Durham, N. H.

# PROGRAM OF THE SIXTEENTH ANNUAL MEETING.

---

At Mechanics Hall, Manchester, N. H.,

October 20, 21, and 22, 1910.

THURSDAY, OCTOBER 20, 2 P. M.

Prayer.....Rev. A. Francis Walsh  
Address of Welcome.....L. Ashton Thorp  
Response .....President C. C. Shaw

Session on Peach Growing:

The Outlook for Peach Growing in New Hampshire,  
W. H. Wolff, Durham

Varieties of Peaches for New Hampshire,  
E. B. Parker, Wilton, N. H.

The Common Diseases of the Peach and Their Treatments,  
Dr. Charles Brooks, Durham, N. H.

Appointment of Committees.

EVENING, 7.30 P. M.

Session on Demonstration Orchards:

The Demonstration Orchards of Connecticut,  
Prof. C. D. Jarvis, Storrs, Conn.

Would Demonstration Orchards Encourage Fruit Growing  
in New Hampshire?

B. S. Pickett, Durham, N. H.

FRIDAY, OCTOBER 21, 9 A. M. TO 10.30 A. M.

BUSINESS MEETING.

Address of the President.....C. C. Shaw, Milford, N. H.

Reports from County Directors.

Report of the Treasurer.....T. E. Hunt, Meredith, N. H.

Report of the Secretary.....B. S. Pickett, Durham, N. H.

Election of Officers.

Reports of Committees.

Miscellaneous Business.

10.30 A. M.—Vegetable Gardening Session:

Early Tomatoes and Egg Plants,

Stanley K. Lovell, Goffstown, N. H.

Manures and Fertilizers for the Vegetable Garden,

J. J. Gardner, Durham, N. H.

Ornamental Vegetable Gardens,

David Lumsden, Durham, N. H.

2.00 P. M.—Insect Control Session:

Investigations on the Apple Maggot or Railroad Worm,

Prof. W. C. O'Kane, Durham, N. H.

The Spread and Control of the Gypsy and Brown-Tail  
Moth,

Prof. F. W. Rane, Boston, Mass.

8 P. M.—Of Special Interest to the Public:

The Effects of the New England Fruit Show on Massa-  
chusetts Apples,

J. Lewis Ellsworth, Sec'y Massachusetts

State Board of Agr., Worcester, Mass.

Coöperation Among Fruit Growers,

Alexander McNeill, Chief of Fruit Division.

Dept. of Agr., Ottawa, Can.

## MINUTES OF THE SIXTEENTH ANNUAL MEETING.

---

The annual business meeting of the New Hampshire Horticultural Society was held in the First Universalist church, Manchester, October 21, 1910, at 9 A. M., President Shaw presiding.

President Shaw in a short address called attention to the objects of the society and pointed out the urgent necessity for more money to conduct its work.

The minutes of the last meeting were read and adopted.

The treasurer's report, having been duly audited, was read and accepted.

The secretary made a brief report covering the work performed by his office and suggesting other lines of effort.

The report of the county directors was then presented, the following being present or furnishing reports:

For Belknap county, F. A. Badger, Belmont.

For Carroll county, D. R. Slade, Center Harbor.

For Cheshire county, Sidney C. Ellis, Keene.

For Grafton county, Thomas E. Hunt, Meredith.

For Hillsborough County, E. B. Parker, Wilton.

For Merrimack county, John T. Harvey, Pittsfield.

For Rockingham county, C. W. Barker, Exeter.

The annual election of officers then occurred and resulted as follows:

### OFFICERS FOR 1911.

*President*, C. C. SHAW, Milford.

*Vice-President*, J. T. HARVEY, Pittsfield.

*Secretary*, B. S. PICKETT, Durham.

*Treasurer*, T. E. HUNT, Meredith.

## EXECUTIVE COMMITTEE.

THE OFFICERS AND	E. B. PARKER,
C. W. BARKER,	F. A. BADGER.

## DIRECTORS.

Rockingham county, C. W. Barker, Exeter.  
Belknap county, F. A. Badger, Belmont.  
Hillsborough county, E. B. Parker, Wilton.  
Carroll county, D. R. Slade, Centre Harbor.  
Merrimack county, E. N. Sawyer, Salisbury.  
Cheshire county, Sidney C. Ellis, Keene.  
Grafton county, W. D. Baker, Quincy.  
Coös county, J. A. Costello, Lancaster.  
Strafford county, A. I. Hall, Rochester.  
Sullivan county,

On motion of Mr. C. W. Barker, it was voted to empower the directors to select three from their number to act as an executive committee, the president and secretary to be ex officio members of the committee.

Mr. C. W. Baker, Mr. E. B. Parker, and Mr. F. A. Badger were later appointed.

The following resolutions were passed at a later session of the society:

*Resolved*, That this society tender its hearty thanks to the Manchester Board of Trade for the accommodations rendered in providing a suitable hall for the annual exhibition.

*Resolved*, That this society tender its hearty thanks to the delegates from Connecticut, Massachusetts, Maine, and other states for the active part which they have taken in our discussions, and, further, that we officially express our appreciation of the honor they have done us in attending our meetings.

*Resolved*, That this society earnestly prays our legislature to increase the grant for the New Hampshire Horticultural Society from \$500 to \$1,000 per year, and that \$300 extra



shall be granted in 1911 for the purpose of making an exhibit at the New England Fruit Show, which will be held in Boston in 1911.

*Resolved*, That for the benefit of the fruit-growing interests, a fund of \$500 be provided to promote public demonstrations of orchard practice.

*Resolved*, That this society is in sympathy with the attitude of President Mellen of the Boston & Maine Railroad, as expressed in his address delivered before the Wonalancet Club at Concord, N. H., on Thursday evening, October 20, and we express the hope that results in the matter of freight rates and shipping facilities may be speedily forthcoming.

*Resolved*, That this society earnestly prays our legislature to grant to the railroads of the state the privilege of running agricultural demonstration trains for the benefit of the horticultural interests of the state, and, further, that our legislative committee be instructed to use every honorable means at their command to further such legislation.

*Resolved*, That this society would endorse and does recommend legislation which would require all apple trees within the limits of the state to be properly and carefully sprayed for the codling moth at least once each year.

*Resolved*, That this society heartily endorse the construction of an experimental cool and cold storage house for vegetables and fruits in connection with the Department of Horticulture at the New Hampshire State College.

*Resolved*, That this society would endorse and does recommend legislation which would exempt from taxation all orchards of five acres or more which may be planted after March 1, 1911, in the state of New Hampshire, for a period of ten years for apples and pears, and for a period of five years for quinces and stone fruits, namely, plums, peaches, and cherries.

*Resolved*, That this society lend its support and coöperation to any measure which will solve the problem of damage done the horticultural interests of the state by deer and squirrels. We recommend legislation which will provide an

open season on deer from December 15 to January 15 each year, and the removal of the squirrel law in such parts of the state as the horticultural interests seem to demand.

The meeting adjourned at 10.45 to continue the program of papers and addresses.

B. S. PICKETT,  
*Secretary.*

## TREASURER'S REPORT.

---

Thomas E. Hunt in account with the New Hampshire Horticultural Society.

### MISCELLANEOUS ACCOUNT.

#### DR.

1909.		
Oct. 28.	To balance .....	\$4.62
28.	cash, E. D. Sanderson.....	50.00
Nov. 5.	cash, E. D. Sanderson.....	64.67
5.	order No. 164.....	50.08
1910.		
June 30.	order No. 176.....	104.41
Feb. 9.	cash, E. D. Sanderson.....	36.00
	cash, E. D. Sanderson.....	26.00
		\$335.78

#### CR.

1909.		
Nov. 5.	Paid order No. 164.....	\$50.08
8.	note and interest.....	75.37
Dec. 10.	Rumford Printing Co.....	16.85
1910.		
Jan. 26.	C. E. Hardy.....	5.00
26.	H. Simons .....	5.00
Feb. 10.	Scientific Engraving Co.....	8.90
12.	C. L. Stoddard.....	5.00
16.	J. B. Page.....	5.00

June 28.	Paid Rumford Printing Co.....	\$54.00
30.	order No. 176.....	104.41
	T. E. Hunt, traveling expenses.	4.32
	discounts on checks.....	.30
	cash on hand.....	1.55
		<hr/>
		\$335.78

THOMAS E. HUNT,

*Treasurer.*

Thomas E. Hunt in account with the New Hampshire Horticultural Society.

## STATE APPROPRIATION.

## DR.

1910.

Oct. 14.	Received on appropriation.....	\$104.34
Dec. 21.	Received on appropriation.....	367.32
		<hr/>
		\$471.66

## CR.

1910.

Oct. 14.	Paid Rumford Printing Co.....	\$80.34
14.	B. S. Pickett.....	23.50
Dec. 22.	T. E. Hunt, carfare and ex-	
	penses .....	4.78
22.	H. J. Rock, printing sign.....	8.46
22.	C. D. Jarvis, lecture.....	42.55
22.	J. B. Varick Co., supplies.....	1.21
22.	C. C. Shaw, traveling expenses	6.77
22.	New City hotel, hotel bill.....	39.50
23.	Alex McNeill, lecture.....	25.00
23.	F. W. Rane, lecture.....	15.30
	premiums .....	224.25
		<hr/>
		\$471.66

Due on appropriation ..... \$28.34

THOMAS E. HUNT,

*Treasurer.*

## PREMIUMS AWARDED AT THE SIXTEENTH ANNUAL MEETING.

---

(Held in Manchester, October 20, 21, 22, 1910.)

### FRUIT DEPARTMENT.

#### APPLES.

- No. 1. General exhibit of apples grown by the exhibitor and not less than ten varieties. First, E. B. Parker, \$6; second, H. B. Sanborn, \$4; third, E. N. Sawyer, \$3.
- No. 2. Best barrel of apples. First, C. E. Hardy, \$10; second, Mrs. Henry Coffin, \$5.
- No. 3. Best box of apples. First, C. E. Hardy, \$10; second, C. E. Hardy, \$5.
- No. 4. Baldwin. First, C. E. Hardy, \$1; second, A. E. Shedd, 50 cents.
- No. 5. Fameuse. First, E. G. Batchelder, \$1; second, E. N. Sawyer, 50 cents.
- No. 6. Gravenstein. First, C. E. Hardy, \$1; second, E. B. Parker, 50 cents.
- No. 7. Hubbardston. First, E. N. Sawyer, \$1; second, E. G. Batchelder, 50 cents.
- No. 8. King. First, E. B. Parker, \$1; second, E. S. Walker, 50 cents.
- No. 9. McIntosh Red. First, E. B. Parker, \$1; second, C. E. Hardy, 50 cents.
- No. 10. Northern Spy. First, E. S. Walker, \$1; second, E. N. Sawyer, 50 cents.
- No. 11. R. I. Greening. First, E. S. Walker, \$1; second, E. N. Sawyer, 50 cents.



- No. 12. Roxbury Russet. First, E. G. Batchelder, \$1; second, E. A. Hills, 50 cents.
- No. 13. Wealthy. First, E. B. Parker, \$1; second, E. G. Batchelder, 50 cents.
- No. 14. Williams Favorite. First, E. B. Parker, \$1; second, C. C. Shaw, 50 cents.
- No. 15. Yellow Bellflower. First, E. N. Sawyer, \$1; second, G. F. Hills, 50 cents.
- No. 16. The Col. G. B. Leighton cup for the best collection of apples under Numbers 4 to 15. E. B. Parker, silver cup, plates of five apples each.
- No. 17. Arctic. First, W. J. Royce, 50 cents; second, J. W. Tarr, 25 cents.
- No. 18. Ben Davis. First, E. N. Sawyer, 50 cents; second, C. E. Hardy, 25 cents.
- No. 19. Black Gilliflower. First, T. H. Buckshorn, 50 cents; second, E. G. Batchelder, 25 cents.
- No. 20. Blue Pearmain. First, C. E. Hardy, 50 cents; second, E. B. Parker, 25 cents.
- No. 21. Chenango. First, N. S. Drake, 50 cents; second, E. B. Parker, 25 cents.
- No. 25. Fallowater. First, N. S. Drake, 50 cents; second, E. N. Sawyer, 25 cents.
- No. 27. Fall Pippin. First, W. S. Whipple, 50 cents; second, E. B. Parker, 25 cents.
- No. 28. Golden Pippin. No first. Second, E. G. Batchelder, 25 cents.
- No. 31. Grimes Golden. No first. Second, G. E. Waite, 25 cents.
- No. 33. Late strawberry. First, S. B. Stearns, 50 cents.
- No. 34. Maiden Blush. First, W. L. Whittemore, 50 cents; second, E. S. Walker, 25 cents.
- No. 35. Newton Pippin. First, C. C. Shaw, 50 cents.
- No. 36. Nodhead. First, E. B. Parker, 50 cents; second, C. C. Shaw, 25 cents.
- No. 37. Pewaukee. First, E. B. Parker, 50 cents; second, H. B. Sanborn, 25 cents.

- No. 38. Porter. First, E. S. Walker, 50 cents; second, E. B. Parker, 25 cents.
- No. 39. Pound Sweet. First, Mrs. Wesley Adams, 50 cents; second, W. L. Whittemore, 25 cents.
- No. 40. Red Astrachan. No first. Second, C. C. Shaw, 25 cents.
- No. 41. Red Canada. First, Mrs. Henry Coffin, 50 cents; second, T. C. Sweatt, 25 cents.
- No. 42. Spitzenburg. First, E. B. Parker, 50 cents; second, W. S. Whipple, 25 cents.
- No. 43. Sutton Beauty. First, E. G. Batchelder, 50 cents.
- No. 44. Sweet Bough. First, E. B. Parker, 50 cents.
- No. 45. Talman Sweet. First, E. G. Batchelder, 50 cents; second, W. S. Whipple, 25 cents.
- No. 46. Twenty Ounce. First, E. G. Batchelder, 50 cents; second, E. S. Walker, 25 cents.
- No. 47. Wagener. First, E. B. Parker, 50 cents.
- No. 49. Wolfe River. First, John Hobbs, 50 cents.
- No. 50. Yellow Transparent. Second, E. B. Parker, 25 cents.

## PEARS.

- No. 54. General exhibit of pears grown by the exhibitor and not less than eight varieties. First, E. N. Sawyer, \$5; second, H. B. Sanborn, \$3.
- No. 55. Bartlett. First, E. N. Sawyer, 50 cents.
- No. 56. Buerre Bosc. First, G. F. Hills, 50 cents; second, E. N. Sawyer, 25 cents.
- No. 57. Buerre Clairgeau. First, C. C. Shaw, 50 cents.
- No. 58. Buerre Diel. First, H. B. Sanborn, 50 cents.
- No. 59. Buerre d'Anjou. First, G. E. Barnard, 50 cents. Second, E. N. Sawyer, 25 cents.
- No. 62. Doyenne Boussock. First, E. N. Sawyer, 50 cents.
- No. 64. Howell. First, H. B. Sanborn, 50 cents.
- No. 65. Lawrence. First, C. C. Shaw, 50 cents.
- No. 67. Onondaga. First, H. L. and H. W. Peaslee, 50 cents.

- No. 68. Seckel. First, E. N. Sawyer, 50 cents; second, H. B. Sanborn, 25 cents.
- No. 69. Sheldon. First, H. B. Sanborn, 50 cents; second, J. F. Hook, 25 cents.
- No. 71. Vicar. First, C. C. Shaw, 50 cents.
- No. 72. Winter Nelis. First, C. C. Shaw, 50 cents; second, E. N. Sawyer, 25 cents.
- No. 73. Orange. First, H. B. Sanborn, 50 cents; second, S. E. Aiken, 25 cents.
- No. 74. Champion. Second, G. E. Barnard, 25 cents.
- No. 76. General exhibit of peaches grown by the exhibitor, and not less than four varieties. Second, E. B. Parker, \$1.00.
- No. 79. Early Crawford. Second, H. L. and H. W. Peaslee, 25 cents.
- No. 80. Elberta. First, H. L. and H. W. Peaslee, 50 cents.
- No. 81. Foster. Second, H. L. and H. W. Peaslee, 25 cents.
- No. 83. Mountain Rose. Second, H. B. Sanborn, 25 cents.

## PLUMS.

- No. 87. Burbank. First, H. B. Sanborn, 50 cents.

## GRAPES.

- No. 96. General exhibit of grapes grown by the exhibitor, and not less than four varieties. First, H. L. and H. W. Peaslee, \$3.
- (c) Delaware. Second, H. L. and H. W. Peaslee, 25 cents.
- (e) Concord. Second, H. L. and H. W. Peaslee, 25 cents.
- (g) Niagara. First, H. L. and H. W. Peaslee, 50 cents.
- (h) Worden. First, H. L. and H. W. Peaslee, 50 cents.
- No. 98. Gratuities on varieties not scheduled:

## APPLES.

Red Russet, 50 cents, E. E. Sawyer.

Northern Spy, 50 cents, L. H. Buckshorn.

Winter Banana, 50 cents, L. H. Buckshorn.  
 Gano, 50 cents, E. B. Parker.  
 Bailey Sweet, 50 cents, Henry Moore.  
 Bailey Sweet, 25 cents, W. J. Boyce.  
 Green Sweet, 50 cents, McIntosh and Tuttle.  
 Green Sweet, 25 cents, C. Lindahl.

## PLUMS.

Moore's Arctic, 25 cents, H. B. Sanborn.  
 Kelsey, 25 cents, H. B. Sanborn.

## PEACHES.

Stump, 25 cents, H. L. and H. W. Peaslee.

## GRAPES.

Green's Early, 25 cents, H. L. and H. W. Peaslee.  
 Wyoming Red, 50 cents, H. L. and H. W. Peaslee.  
 Early Ohio, 25 cents, H. L. and H. W. Peaslee.  
 Pocklington, 25 cents, H. L. and H. W. Peaslee.

## SPECIAL PRIZES.

- No. 301. Pomona barrel spray pump for best sprayed apples. First, H. B. Sanborn, Concord, N. H.  
 No. 302. Pratt scalecide cup for best three bushel boxes of three varieties. First, J. T. Moore, Boscawen, N. H.

## SPECIAL PRIZES OPEN TO NEW ENGLAND.

- No. 303. Best barrel of apples, variety and packing to be considered, Baldwins. Mrs. Henry Coffin, Boscawen, N. H., \$50.  
 No. 304. Best box of apples, variety and packing to be considered. Alden Derby, Leominster, Mass., \$25.  
 No. 305. Best barrel apples, Baldwins. First, Mrs. Henry Coffin, Salisbury, Mass., \$10; special, E. N. Sawyer, \$5.  
 No. 306. Northern Spy. First, George S. Wright & Sons, Middleboro, Vt., \$10.  
 No. 307. McIntosh. First, Alden Derby, Leominster, Mass., \$10.

- No. 308. R. I. Greenings. First, George H. Wright & Sons, Middleboro, Vt., \$10.
- No. 309. Gravenstein. First, Alden Derby, Leominster, Mass., \$10.
- No. 310. Best box apples, Baldwin. First, Alden Derby, Leominster, Mass., \$5.
- No. 311. Northern Spy. First, Everett Brown, Pomfret Centre, Conn., \$5.
- No. 312. McIntosh. First, C. E. Hardy, Hollis, N. H., \$5.
- No. 313. R. I. Greenings. First, Alden Derby, Leominster, Mass., \$5.
- No. 314. Gravenstein. First, C. E. Hardy, Hollis, N. H., \$5.
- Special. Barrel King. Everett Brown, Pomfret Centre, Conn., \$10.
- Special exhibit (plate of five apples). First, W. P. Tenney, Baldwin, \$1; second, Sawyer & Co.; Roxbury Russets, 50 cents.

## VEGETABLE DEPARTMENT.

### BEETS.

- No. 102. First, L. G. Flanders, \$1; second, S. Corey & Son, 50 cents; third, C. Swindlehurst, 25 cents.

### CABBAGES.

- No. 104. Round or flat. First, S. Corey & Son, 50 cents.
- No. 105. Savoy. First, S. Corey & Son, 50 cents.
- No. 106. Red cabbages. First, S. Corey & Son, 50 cents.
- No. 108. Cauliflower (three specimens). First, S. Corey & Son, 50 cents.

### CARROTS.

- No. 109. Long Orange type. First, S. Corey & Son, 50 cents.
- No. 110. Danvers, one half long type. First, S. Corey & Son, 50 cents.



## LETTUCE.

No. 115. Loose. First, C. Ward, 50 cents.

## MELONS.

No. 117. Watermelon. First, C. Swindlehurst, 50 cents;  
second, S. Corey & Son, 25 cents.

No. 118. Muskmelon. Second, S. Corey & Son, 25 cents.

## ONIONS.

No. 120. Yellow. First, E. C. Morse, 50 cents.

No. 121. Red. First, E. C. Morse, 50 cents.

## POTATOES.

No. 129. Green Mountain type. First, S. Corey & Son, 75 cents; second, Henry Fisk, 50 cents.

## SQUASH.

No. 134. Summer. First, S. Corey & Son, 50 cents; second, C. Swindlehurst, 25 cents.

## TOMATO.

No. 138. Scarlet. First, Sarah Woods, 75 cents; second, S. Corey & Sons, 50 cents.

## TURNIP.

No. 140. Early Flat. First, S. Corey & Son, 50 cents.

No. 141. Early Globe-Shape. First, S. Corey & Son, 50 cents.

No. 142. Swedish. First, S. Corey & Son, 50 cents.

No. 143. Cranberries. First, Grace Wales, 50 cents.

No. 147. Kohl Rabi. First, Lambert Carpenter, 50 cents.

## CUCUMBERS.

No. 149. Six specimens in slicing condition. First, C. E. Swindlehurst, 50 cents.

## PLANTS AND FLOWERS.

- No. 152. Best exhibit of decorative plants, not less than ten specimens, arrangement to be considered. First, A. G. Hood, Manchester, N. H., \$5.00.
- No. 153. Best exhibit of cut flowers, A. G. Hood, Manchester, N. H., \$5.

## AMATEUR CLASS.

- No. 154. Best specimen pot plant. First, Sarah Woods, 50 cents.

## CANNED FRUITS DEPARTMENT.

- First, A. Isabelle Batchelder, \$3.  
Second, S. Corey & Son, \$2.  
Third, Mrs. C. Swindlehurst, \$1.
- No. 169. Best exhibit of jellies in glass. First, Mrs. J. T. Harvey, \$3.
- No. 170. Best exhibit of vegetables. First, W. H. Harrison, \$3; second, S. Corey & Son, \$2; third, A. Isabelle Batchelder, \$1.

## LIST OF MEMBERS.

---

### LIFE MEMBERS.

Adams, G. E. . . . .	Peterborough
Barnard, G. E. . . . .	Hopkinton
Barker, C. W. . . . .	Exeter
Bass, R. P. . . . .	Peterborough
Caldwell, W. H. . . . .	Peterborough
Dillingham, T. W., Dr. . . . .	Dublin
Dimond, F. E. . . . .	West Concord
Dimond, O. O. . . . .	West Concord
Ellis, S. C. . . . .	Keene
Farr, F. W. . . . .	Littleton
Faulkner, R. E. . . . .	Keene
Gould, R. F. . . . .	Contoocook
Gowing, F. C. . . . .	Dublin
Hall, H. F. . . . .	Brighton, Mass.
Gowing, H. M. . . . .	Dublin
Hardy, C. E. . . . .	Hollis
Hearty, E. W. J. . . . .	Hillsborough
Hixon, A. A. . . . .	Worcester, Mass.
Leighton, G. B. . . . .	Monadnock
Martin, K. McG. . . . .	Keene
Morrison, Horace, Mrs. . . . .	Peterborough
Morrison, Mary, Miss . . . . .	Peterborough
Parker, E. B. . . . .	Wilton
Parker, F. B. . . . .	Wilton
Parker, G. W. . . . .	Wilton
Rane, F. Wm. . . . .	Waban, Mass.
Sanderson, E. D. . . . .	Morgantown, West Va.

Sawyer, J. H. . . . .	Sandwich
Sawyer, E. E. . . . .	Atkinson Depot
Shaw, C. C. . . . .	Milford
Shaw, H. C. . . . .	Milford
Slade, Daniel, Mrs. . . . .	Center Harbor
Slade, D. R. . . . .	Center Harbor
Tenney, O. M. . . . .	East Hampstead
Tenney, W. C. . . . .	Chester
Tucker, E. E. . . . .	Monadnock
Webster, F. G. . . . .	Holderness
Webster, L. J. . . . .	Holderness
Wheeler, F. W. . . . .	R. F. D. 1, Brookline
Wister, J. C., Wister St. and Clarkson Ave.,	Philadelphia, Penn.
Wood, R. C. . . . .	Dublin
Yeaton, G. H. . . . .	Dover

## ANNUAL MEMBERS.

Abobtt, C. S. . . . .	Antrim
Adams, Margaret . . . . .	Peterborough
Armstrong, G. D. . . . .	Milford
Ashman, J. W. . . . .	Laconia
Avery, Samuel . . . . .	Wolfboro
Ayer, Phyllis W. . . . .	Concord
Bachelder, N. J. . . . .	Concord
Badger, F. A. . . . .	Belmont
Baker, W. D. . . . .	Quincy.
Baker, P. C. . . . .	Hollis
Barker, G. F. . . . .	Stratham
Barker, S. W., 4 Rumford St.,	Concord
Bartlett, R. B. . . . .	Pittsfield
Bartlett, W. H., Route 2 . . . .	Manchester
Barnum, W. A. . . . .	Atkinson
Bass, Mrs. P. . . . .	Peterborough
Batchelder, C. J. . . . .	Wilton
Batchelder, E. J. . . . .	Wilton
Batchelder, Isabelle, Mrs. . . .	Wilton

Boardman, F. F.	Concord
Bruce, H. C.	Milford
Beckwith, R. L.	Centre Harbor
Beckwith, R. L., Mrs.	Centre Harbor
Bemis, W. R.	Marlborough
Blessing, D. S., 4 N. Court St.,	Harrisburg, Pa.
Brierley, Benjamin	Stratham
Brown, S. H.	Greenville
Bushnell, C. E.	Wilton
Carret, J. R., 79 Milk St.	Boston, Mass.
Chase, H. R.	Wilton
Chase, H. H., 3 Knight St.,	West Concord
Cheney, B. R., Mrs.	Peterborough
Clough, A. W.	Greenland
Coburn, O. S., 432 Central St.,	Manchester
Coffin, Mrs. Henry	Boscawen
Colburn, C. A.	Box 122, Hollis
Colby, F. L.	Enfield
Colby, F. E.	Route No. 3, Concord
Corey, H. S.	R. F. D. 6, Manchester
Corey, H. T.	R. F. D. 6, Manchester
Currier, D. M.	Newport
Currier, F. A.	East Tilton
Curtis, A. L.	Wilton
Dean, W. M.	Hollis
Dewing, Frank	Alstead Center
Dodge, R. T.	Henniker
Dow, D. W.	North Epping
Drake, N. S.	Pittsfield
DeRoy, C. A., 158 Summer St.,	Boston, Mass.
De Rochmont, C. M.	Portsmouth
Dudley, A. T.	Exeter
Emerson, C. S.	Milford
Ewart, Thomas, to N. E. Tel.	
& Tel. Co.	Manchester
Felker, Samuel D.	Rochester
Fleming, James	R. D. 4, Concord



Folsom, G. H. . . . .	R. D. 13, Contoocook
Fox, C. K. . . . .	Haverhill, Mass.
Fraser, C. K. . . . .	Peterborough
Freeman, G. B. . . . .	R. D. 2, Haverhill, Mass.
Forsyth, N. S. . . . .	Salem Depot
Geisel, Joseph H., 225 Ash St.,	Manchester
Gilchrist, S. B. . . . .	Grasmere
Gilkey, P. L. . . . .	Rochester
Gilmore, J. R., 250 Mitchell St.,	Manchester
Gowen, George E. . . . .	Stratham
Graves, Dr. E. E. . . . .	Penacook
Greene, Walter S. . . . .	Gilmanton
Gregg, D. A. . . . .	Nashua
Greenleaf, J. A. . . . .	Hollis
Grimes, Miss Ella E. . . . .	Keene
Grimes, J. D. . . . .	Dublin
Grimes, John . . . . .	Dublin
Hadley, H. O. . . . .	Peterborough
Hall, A. I. . . . .	Rochester
Hall, William C. . . . .	Keene
Harvey, J. T. . . . .	Pittsfield
Haughton, Rev. V. M. . . . .	Exeter
Hayward, C. E. L. . . . .	Hancock
Hayward, W. E. . . . .	Temple
Herrick, W. F. . . . .	Lyndeborough
Herrick, J. G. . . . .	North Weare
Hills, C. F. . . . .	Hollis
Holt, Oliver . . . . .	Wilton
Howe, J. D. . . . .	Lancaster
Hubbard, A. B., 1038 Elm St.,	Manchester
Hudson, C. O. . . . .	Laconia
Hutchinson, G. K. . . . .	Wilton
Hunt, T. E. . . . .	Meredith
Jackman, C. L. . . . .	Box 105, Concord
Jenness, D. F. . . . .	Dover
Jenkins, C. A. . . . .	Milford
Keith, W. S. . . . .	Milford

Kimball, F. B.	. . .	Greenville
King, Geo. L., 81 Appleton St.,		Manchester
Lamprey, C. A.	. . .	Laconia
Lane, Harry C.	. . .	Peterborough
Lang, Walter B.	. . .	Atkinson
Langdell, Luther M.	. . .	Wilton
Littlefield, A. L.	. . .	Salem Depot
Littlefield, Ira S.	. . .	New London
Livermore, H. H.	. . .	Wilton
Lovejoy, S. A.	. . .	Milford
Lovell, Stanley K.	. . .	Manchester
Lindhahl, Carl, R. D. 9, Box 148,		Manchester
Mackie, A. L.	. . .	East Kingstontn
Marble, L. G.	. . . R. D. 2,	Haverhill
Malley, C. W.	. . .	Laconia
Marden, George W.	. . .	Wilton
Marshall, W. C., Belknap Mills,		Laconia
Marshall, D. R., 15 W. Broadway,		New York, N. Y.
Mason, Miss Fanny, 211 Com-		
monwealth Ave.	. . .	Boston, Mass.
Milne, George C.	. . .	Monadnock
Montgomery, W. L.	. . .	Contoocook
Moore, J. T.	. . .	Boscawen
Morrill, J. S., 68 Union Ave.,		Laconia
Newell, E. H., 83 Spring St.,		Keene
Noyes, Henry	. . . R. D.,	Westville
Noyes, W. S.	. . .	Atkinson
Nyland, Thomas	. . .	Peterborough
Ormsbee, C. O.	. . .	Montpelier, Vt.
Page, G. A.	. . .	Atkinson
Parker, Charles F.	. . .	Wolfboro
Parker, Horace B.	. . .	Stratham
Pearson, F. H.	. . .	Stratham
Peaslee, H. W.	. . .	Bedford
Perham, C. L.	. . .	Wilton
Phelan, Wm. B.	. . .	Milford
Pickett, B. S.	. . .	Durham

Pierce, William W. . . .	Ashland
Piper, J. C. . . .	Stratham
Piper, L. A. . . .	Keene
Poore, Fred H. . . .	Goffstown
Pickering, Amanda, Miss, R. D. 1,	Portsmouth
Porter, Bernard . . . .	Goffstown
Pratt, O. M. . . .	R. D. 4, Plymouth
Pressey, C. J. . . .	Atkinson Depot
Preston, W. A. . . .	New Ipswich
Proctor, D. E. . . .	Wilton
Richardson, L. F. . . .	Peterborough
Robinson, G. A. . . .	Marlborough
Sanborn, H. B. . . .	R. D. 5, Concord
Sawyer, H. M. . . .	R. D. 2, Haverhill, Mass.
Sawyer, E. N. . . .	Salisbury
Sawyer, Robert S. . . .	Walpole
Selleck, George H. . . .	Exeter
Shedd, Albert E. . . .	New Boston
Smith, Edward M. . . .	North Hampton
Smith, G. F. . . .	Meredith
Smith, F. A. . . .	Ipswich, Mass
Spaulding, D. Minot . . .	Keene
Stanford, E. L. . . .	Keene
Stearns, S. B., The Kennard,	Manchester
Stevens, E. W. . . .	Bedford
Stone, E. J. . . .	Barrington
Swan, H. E. . . .	Keene
Swain, W. B. . . .	East Barrington
Swindlehurst, Mrs. C. . .	Peterborough
Symonds, F. P. . . .	Chesham
Taft, H. J. . . .	Greenville
Tarbell, Fred H. . . .	Wilton
Thompson, W. O. . . .	R. D. 1, Newfields
Thurston, Perley D. . . .	Milford
Turner, Ross . . . .	R. D., Wilton
Wallace, Judge R. M. . . .	Milford
Walbridge, A. J. . . .	Peterborough

Walker, E. S. . . . .	Alton
Webber, Robert I., 16 South St.,	Concord
Webster, Walter H. . . . .	West Canaan
Welch, Oliver E. . . . .	Keene
Wheeler, C. T. . . . .	Greenville
Whiting, David . . . . .	Wilton
Wilson, George R. . . . .	Wolfboro Falls
Wilson, H. A. . . . .	Hollis
Wheeler, H. T., care N. E.	
Tel. & Tel. Co. . . . .	Manchester
Woodman, P. R. . . . .	Milford
Woodward, Harry S. . . . .	Keene
Worthen, S. T., Pine St.,	Manchester
Wright, F. E. . . . .	Brookline
Wyman, J. E. . . . .	Keene
Yorke, B. L., Rev. . . . .	West Medford, Mass.
Young, Augustus . . . . .	Exeter





## INDEX.



# INDEX.

	Page
Addresses at Institutes and Meetings:	
Annual Field Meeting at Hampton Beach, 1909.....	222
Address. By Gov. Henry B. Quinby.....	230
A Man from Two States. By Hon. J. H. Hale, of Connecticut and Georgia.....	228
Forestry. By E. C. Hirst, State Forester.....	223
New Hampshire, a Summer Resort State. Rev. Adolph A. Berle, D. D.....	233
The Mission of the Grange. By W. N. Giles, Skan- cateles, N. Y.....	232
The Relation of High School Agriculture to the Farm- ing Community. By Prof. E. W. Morse, Washing- ton, D. C.....	225
Annual Field Meeting at Hampton Beach, 1910.....	235
Address. By Gov. Henry B. Quinby.....	247
Address. By Hon. Joseph D. Roberts.....	236
Address. By Hon. William E. Chandler.....	241
The Agricultural Outlook. By Hon. R. A. Pearson of New York .....	248
The Grange in the Country. By Aaron Jones, In- diana .....	242
The Grange in New Hampshire. By Richard Pattee..	240
The Organization of Agriculture. By Hon. Willett M. Hayes, Washington, D. C.....	250
Annual Winter Meeting at Exeter, 1910.....	70
Agricultural Development. By W. T. Billings.....	111
Dairy Conditions in New Hampshire. By Prof. Fred Rasmussen .....	139
Experiments in Rotative Cropping and Manuring. By Dr. H. J. Wheeler.....	81
Farming for Profit. By N. P. Hull, Diamondale, Mich. ....	157
Forestry in New Hampshire. By E. C. Hirst.....	148

	Page
Importance of Food Inspection Work. By Prof. B. H. Smith, Washington, D. C.....	179
Improvement of the Milk Supply. By Prof. Ivan C. Weld .....	132
New Hampshire, the Belgium of America. By O. L. Frisbee, Portsmouth, N. H.....	204
Shall We Revive the Sheep Industry? By F. H. Buf-fum .....	105
Ten Years Observation in the Dairy Business. By W. D. Hayden, Dover, N. H.....	215
The Grange from the Viewpoint of a Nonmember. By Dr. J. D. Quackenbos, New London, N. H.....	207
The Importance of the Availability of Fertilizer Con-stituents. By Prof. E. B. Voorhees, New Brunswick, N. J. ....	165
What of the Corn Crop and How to Improve It. By Dr. G. M. Twitchell, Auburn, Me.....	121
Cornish Flat .....	65
Corn Improvement. By Doctor Twitchell.....	66
Grantham .....	34
Motherhood of the Dairy Cow. By Prof. H. E. Cook, Denmark, N. Y.....	34
The Needs of New Hampshire Forestry. By Professor Pickett .....	35
Hollis .....	3
Maintaining Soil Fertility. By Professor Clinton....	3
Relation of the Experiment Station to the Farmer. By Professor Rasmussen .....	6
The National Grange. By Secretary Bachelder.....	8
Thorough Cultivation of the Soil. By Chairman Had-ley .....	5
Hudson .....	10
A Profitable Crop. By Secretary Bachelder.....	12
Good Citizenship. By Chairman Hadley.....	15
How to Increase the Profits in Dairying. By Profes-sor Rasmussen .....	10
Modern Methods of Potato Growing. By Professor Clinton .....	14
Lempster .....	31
Losses in Potato Growing. By Prof. B. S. Pickett...	31
Lyndeborough .....	49
Care of the Apple Orchard. By Charles E. Hardy....	50
Feeding of Dairy Cattle. By Professor McNutt.....	54
Maintaining Soil Fertility. By Professor Clinton.....	52

	Page
Modern Methods of Potato Culture. By Professor Clinton .....	55
Thorough Cultivation. By H. O. Hadley.....	57
Meredith Center .....	17
Farm Buttermaking. By Professor Rasmussen.....	20
How to Increase the Corn Crop. By H. O. Hadley....	19
Seeding and Management of Grass Land. By Professor Clinton .....	17
Merrimack .....	58
Live Stock Management. By Professor McNutt.....	58
Munsonville .....	23
Dairy Feeding from a New Standpoint. By Prof. H. E. Cook, Denmark, N. Y.....	23
Fertilizers. By Prof. H. E. Cook, Denmark, N. Y....	25
North Conway .....	37
Commercial Fertilizers vs. Chemicals. By Prof. F. W. Taylor .....	38
Grain Growing in New Hampshire. By Prof. F. W. Taylor .....	38
Potatoes a Cash Crop Every Year. By Doctor Twitchell .....	40
Surry .....	27
Feeds for the Dairy. By Professor Morse.....	28
Soil Drainage. By Prof. H. E. Cook, Denmark, N. Y..	30
Ventilation and Construction of Stable. By Prof. H. E. Cook, Denmark, N. Y.....	27
Wakefield .....	43
A Live Message for Every Man. By Doctor Twitchell	46
Where Are the Dollars? By Doctor Twitchell.....	43
West Chesterfield .....	61
Keeping Sheep for Profit. By L. B. Harris, Lyndonville, Vt. ....	61
Cattle Commissioners, 1909-1910.....	375
Admission of Cattle to the State of New Hampshire....	412
Board of Cattle Commissioners.....	377
Cattle and Stable Inspection, 1909-1910.....	390
Financial Statement .....	411
Quarantine Regulations .....	383
Report .....	379
The Text of the Law.....	379
Fertilizers .....	327
Analyses of Fertilizers, 1909.....	329
Composition of Commercial Fertilizers, 1909.....	332
Composition of Commercial Fertilizers, 1910.....	340



	Page
Inspection of Fertilizers, 1910.....	337
Schedule of Trade Values for 1909.....	329
General Report .....	v
Horticultural Society .....	437
List of Members .....	457
Minutes of the Sixteenth Annual Meeting.....	443
Officers .....	439
Premiums Awarded .....	449
Program of the Sixteenth Annual Meeting.....	441
Treasurer's Report .....	447
Inspection of Feeding Stuffs, 1909.....	299
Average Composition of Common Cattle Foods.....	316
Composition of Commercial Feeding Stuffs, 1909.....	302
Proposed Amendment of the Feed Law.....	309
The Present Feed Law.....	305
Uniform Feed Stuff Law.....	311
Inspection of Feeding-stuffs, 1910.....	317
Average Composition of Common Cattle Foods.....	325
Results of the Feed Inspection.....	320
Seeds .....	345
Expenses of Analyses and Tests.....	373
Kinds of Impurities.....	372
Labeling .....	370
Methods of Examination and Testing.....	373
Reporting Results of Tests.....	372
Seed Examination, 1910.....	349
Seed Tests .....	347
Sending of Samples.....	371
Size and Amount of Samples.....	371
Standards .....	368
Standards of Purity and Germination.....	369
Taking of Samples .....	371
Tests and Examinations.....	370
The Object of the Law.....	368
The Text of the Law.....	366
State Grange, 1910.....	415
Officers .....	417
Pomona Granges .....	419
Subordinate Granges .....	421
Summer Homes. By H. C. Pearson.....	255





# ANNUAL REPORTS

OF THE

BOARD OF VISITORS, TRUSTEES, SUPERINTENDENT,

TREASURER, AND FINANCIAL AGENT OF THE

NEW HAMPSHIRE

# STATE HOSPITAL

TO THE

GOVERNOR AND COUNCIL

---

AUGUST, 1910

PRINTED BY THE JOHN B. CLARKE COMPANY MANCHESTER  
BOUND BY RUMFORD PRINTING CO CONCORD



# CONTENTS.

---

	Page
Officers of the Institution.....	5
Resident Officers .....	6
Visiting Committee .....	7
Report of Board of Visitors.....	8
Report of the Financial Agent to August 31, 1909....	9
Report of the Financial Agent to August 31, 1910....	11
Report of the Trustees.....	25
Report of the Superintendent.....	32
Statistical Tables for Year Ending August 31, 1909...	38
Statistical Tables for Year Ending August 31, 1910...	48
Statistics of Admission, etc., since Opening of Hospital	58
Treasurer's Report for Year Ending August 31, 1909..	60
Treasurer's Report for Year Ending August 31, 1910..	64
Officers' Salaries .....	69
Financial Report of Building Committee, 1907-08....	70
Financial Report of Building Committee, 1909-10....	78
Statement of Appropriation Account of 1909-10.....	92
General Exhibit, 1909.....	93
General Exhibit, 1910.....	96
Appendix:	
Directions Concerning Admission.....	101
Form of Bond.....	102
Form of Petition.....	103
Form of Certificate of Insanity.....	103
Commitment of Dependent Insane.....	104
Order for Support of Town and County Patients....	104
Application for State Aid for Indigent Insane....	105
Special Notice .....	106

	Page
Laws Relating to Hospital.....	107
By-Laws Adopted by Trustees.....	130
Training School for Nurses.....	135
Questions to be Answered by Candidates.....	137
Graduates of School.....	137
Address at Graduation.....	143
Service Manual .....	156
Succession of Officers.....	172

# OFFICERS OF THE INSTITUTION.

---

## BOARD OF VISITORS.

*(Ex Officio.)*

HIS EXCELLENCY HENRY B. QUINBY.

HON. ALONZO M. FOSS, Dover.

HON. HENRY W. BOUTWELL, Manchester.

HON. ALBERT ANNETT, Jaffrey.

HON. JAMES G. FELLOWS, Pembroke.

HON. LYFORD A. MERROW, Ossipee.

HON. HARRY T. LORD, *President of the Senate.*

HON. WALTER W. SCOTT.

*Speaker of the House of Representatives.*

---

## BOARD OF TRUSTEES.

JOHN A. SPALDING, *President*, Nashua.

EDGAR O. CROSSMAN, M. D., Lisbon.

WILLIAM F. THAYER, Concord.

F. S. TOWLE, M. D., Portsmouth.

GEORGE W. PIERCE, M. D., Winchester.

GEORGE H. SALTMARSH, M. D., Laconia.

JOHN McCRILLIS, Newport.

WILLIAM PARKER STRAW, Manchester.

ROGER G. SULLIVAN, Manchester.

GEORGE M. KIMBALL, M. D., Concord.

HENRY W. ANDERSON, Exeter.

BENJAMIN W. COUCH, Concord.

## RESIDENT OFFICERS.

---

C. P. BANCROFT, M. D.	Superintendent
C. H. DOLLOFF, M. D.	First Assistant Physician
J. B. MacDONALD, M. D.	Second Assistant Physician
A. B. HOWARD, M. D.	Assistant Physician
M. H. TOWLE, M. D.	Assistant Physician
MR. A. F. TANDY	Steward
MRS. MARY A. TANDY	Housekeeper
MISS ETTA MAY BAGLEY	Superintendent Training School
MR. M. P. RYAN	Supervisor
MR. WILLIAM M. MOORE	Engineer

## VISITING COMMITTEE.

---

### FIRST HALF OF MONTHS.

1910.

December. DR. E. O. CROSSMAN, Lisbon.

1911.

January. MR. WILLIAM F. THAYER, Concord.

February. DR. F. S. TOWLE, Portsmouth.

March. DR. GEORGE H. SALTMARSH, Laconia.

April. DR. E. O. CROSSMAN, Lisbon.

May. HON. JOHN A. SPALDING, Nashua.

June. DR. GEORGE M. KIMBALL, Concord.

July. HON. HENRY W. ANDERSON, Exeter.

August. MR. BENJAMIN W. COUCH, Concord.

September. MR. JOHN McCRILLIS, Newport.

October. DR. GEORGE W. PIERCE, Winchester.

November. MR. BENJAMIN W. COUCH, Concord.

### SECOND HALF OF MONTHS.

1910.

December. DR. GEORGE W. PIERCE, Winchester.

1911.

January. HON. HENRY W. ANDERSON, Exeter.

February. MR. ROGER G. SULLIVAN, Manchester.

March. MR. WILLIAM P. STRAW, Manchester.

April. MR. W. F. THAYER, Concord.

May. DR. G. H. SALTMARSH, Laconia.

June. MR. JOHN McCRILLIS, Newport.

July. MR. JOHN A. SPALDING, Nashua.

August. MR. WM. PARKER STRAW, Manchester.

September. MR. ROGER G. SULLIVAN, Manchester.

October. DR. F. S. TOWLE, Portsmouth.

November. DR. GEORGE M. KIMBALL, Concord.



# REPORT OF BOARD OF VISITORS.

---

## STATE OF NEW HAMPSHIRE.

### EXECUTIVE DEPARTMENT.

CONCORD, N. H., September 1, 1910.

The governor and council, as required by law, having visited the New Hampshire State Hospital, inspected the several departments and examined into the condition of the patients, are satisfied that the design of the institution is carried into full effect by the existing management.

HENRY B. QUINBY,

*Governor.*

ALONZO M. FOSS,

HENRY W. BOUTWELL,

ALBERT ANNETT,

JAMES G. FELLOWS,

LYFORD A. MERROW,

*Councillors.*

# REPORT OF THE FINANCIAL AGENT.

From September 1, 1908, to August 31, 1909.

## RECEIPTS.

Balance on hand August 31, 1908.....	\$1,503.63
Received from sale 1 Boston & Lowell bond .....	\$1,000.00
rebate on cancelled insurance policies..	1,664.62
interest and dividends	13,758.28
	<hr/>
	16,422.90
	<hr/>
	\$17,926.53

## EXPENDITURES.

Cash paid treasurer towards support of indigent patients, etc. (11 months).....	\$7,333.34
paid treasurer, for improvement of hospital grounds .....	500.00
paid treasurer, for income of Conant fund (11 months) .....	275.92
paid treasurer, for income of Adams fund	147.00
paid for 10 shares Northern (N. H.) R. R.	1,492.50
paid for insurance .....	525.00
paid Merrimack county registry of deeds..	1.62
paid for real estate.....	3,000.00
paid Fidelity and Deposit Co.....	62.50
paid William F. Thayer, financial agent..	800.00
	<hr/>
	\$14,137.88
Balance on hand August 31, 1909.....	3,788.65
	<hr/>
	\$17,926.53

(Signed)

W. F. THAYER,

*Financial Agent.*

I have this day examined the foregoing account and find proper vouchers for all expenditures, and a cash balance of thirty-seven hundred eighty-eight and sixty-five one hundredths dollars (\$3,788.65), in the hands of the financial agent.

(Signed)

W. B. FELLOWS,

*State Auditor.*

NOVEMBER 19, 1909.

The following were the several permanent funds of the hospital on the first day of September, 1909, accompanied by a list of the securities in which they are invested:

#### ADAMS FUND.

(Gift of Isaac Adams, of Sandwich.)

New York, New Haven & Hartford Railroad.	
Harlem River & Port Chester Division bond	\$400.00
Iowa Loan & Trust Company bond.....	1,000.00
City of Concord (N. H.) bonds.....	600.00
10 shares Pittsburg, Fort Wayne & Chicago Railroad .....	1,000.00
	<hr/>
	\$3,000.00

#### BURROUGHS FUND.

(Legacy of Rev. Charles Burroughs, D. D., of Portsmouth.)

Northern Pacific-Great Northern Railroad bond	
(Chicago, Burlington & Quincy Railroad, joint	
4s) .....	\$1,000.00

#### CHANDLER FUND.

(Legacy of Abiel Chandler, of Walpole.)

Chicago & Northwestern Railroad bond (Milwaukee, Lake Shore & Western).....	\$1,000.00
Iowa Loan & Trust Company bonds.....	800.00
New York, New Haven & Hartford Railroad bonds .....	2,000.00

Old Colony Railroad bond.....	\$1,000.00
Boston & Lowell Railroad bond.....	5,000.00
Concord & Montreal Railroad bonds.....	2,000.00
Boston & Maine Railroad bonds.....	8,000.00
62 shares Boston & Maine Railroad.....	6,200.00
10 shares Michigan Central Railroad.....	1,000.00
10 shares Pittsburg, Fort Wayne & Chicago Rail- road .....	1,000.00
3 shares State National Bank, Boston, Mass....	300.00
17 shares Northern (N. H.) Railroad.....	1,700.00
	<hr/>
	\$30,000.00

## CONANT FUND.

(Legacy of John Conant, of Jaffrey.)

Concord & Montreal Railroad bonds.....	\$2,000.00
Iowa Loan & Trust Company bonds.....	4,000.00
3 shares Boston & Maine Railroad.....	300.00
2 shares Boston & Providence Railroad.....	200.00
	<hr/>
	\$6,500.00

## CREIGHTON FUND.

(Legacy of Mrs. S. E. W. Creighton, of Newmarket.)

Boston & Providence Railroad bonds.....	\$1,000.00
Boston & Maine Railroad bonds.....	2,000.00
	<hr/>
	\$3,000.00

## DANFORTH FUND.

(Legacy of Mary Danforth, of Boscawen.)

City of Concord (N. H.) bonds.....	\$400.00
------------------------------------	----------

## FISK FUND.

(Legacy of Miss Catharine Fisk, of Keene.)

Fisk fund held in trust by the state.....	\$26,378.43
---	-------------

## FULLER FUND.

(Legacy of Mrs. Peggy Fuller, of Francestown.)

20 shares Boston & Maine Railroad.....	\$2,000.00
--	------------

## KENT FUND.

(Legacy of Moody Kent, of Pittsfield.)

City of Concord (N. H.) bonds.....	\$200.00
City of Minneapolis (Minn.) bonds.....	3,000.00
Oregon Short Line Railroad bonds.....	5,000.00
New York, New Haven & Hartford Railroad bonds .....	6,000.00
Chicago, Burlington & Quincy Railroad bonds..	10,000.00
Chicago & Northwestern Railroad bonds.....	9,000.00
Philadelphia, Wilmington & Baltimore Railroad bonds .....	7,000.00
Boston & Lowell Railroad bonds.....	15,000.00
Concord & Montreal Railroad bonds.....	8,000.00
City of Duluth (Minn.) bonds.....	7,000.00
Northern Pacific Railway bonds.....	5,000.00
St. Joseph & Grand Island Railroad bonds.....	5,000.00
Boston & Maine Railroad bonds.....	5,000.00
Old Colony Railroad bonds.....	12,000.00
Northern Pacific-Great Northern Railroad bonds (Chicago, Burlington & Quincy Railroad, joint 4s) .....	13,000.00
Union Pacific Railroad bonds.....	1,000.00
50 shares Pittsburg, Fort Wayne & Chicago Rail- road .....	5,000.00
7 shares Union National Bank, Lowell, Mass...	700.00
47 shares State National Bank, Boston, Mass...	4,700.00
70 shares St. Joseph & Grand Island Railroad, first preferred .....	7,000.00
25 shares St. Joseph & Grand Island Railroad, second preferred .....	2,500.00
42 shares Northern (N. H.) Railroad.....	4,200.00



100 shares Michigan Central Railroad.....	\$10,000.00
2 shares Boston & Providence Railroad.....	200.00
50 shares Fitchburg (Mass.) National Bank....	5,000.00
	<hr/>
	\$150,500.00

## KIMBALL FUND.

(Legacy of Jacob Kimball, of Hampstead.)

Kimball fund held in trust by the state treasurer	\$6,753.49
---	------------

## LOW FUND.

(Legacy of Abiel A. Low, of Brooklyn, N. Y.)

City of Columbus (Ohio) bonds.....	\$3,000.00
City of Chicago (Ill.) bonds.....	2,000.00
	<hr/>
	\$5,000.00

## PENHALLOW FUND.

(Legacy of H. Louise Penhallow, of Portsmouth.)

Concord & Montreal Railroad bond.....	\$1,000.00
---------------------------------------	------------

## PIPER FUND.

(Legacy of Rhoda C. Piper, of Hanover.)

1 share Union National Bank, Lowell, Mass....	\$100.00
---	----------

## PLUMMER FUND.

(Legacy of William Plummer, of Londonderry.)

New York, New Haven & Hartford Railroad, Harlem River & Port Chester Division bond..	\$500.00
---	----------

## RICE FUND.

(Legacy of Arabella Rice, of Portsmouth.)

Oregon Short Line Railroad bonds.....	\$5,000.00
Old Colony Railroad bonds.....	3,000.00
Chicago & Northwestern Railroad bond.....	1,000.00
Old Colony Railroad registered bond.....	3,000.00

Concord & Montreal Railroad bond.....	\$1,000.00
Boston & Providence Railroad bond.....	1,000.00
City of Cleveland (Ohio) bonds.....	2,000.00
Union Pacific Railroad bonds.....	5,000.00
	<hr/>
	\$21,000.00

## RUMFORD FUND.

(Legacy of the Countess of Rumford, of Concord.)

Concord & Montreal Railroad bonds.....	\$5,000.00
Philadelphia, Wilmington & Baltimore Railroad registered bonds .....	5,000.00
30 shares Pittsburg, Fort Wayne & Chicago Rail- road .....	3,000.00
20 shares Boston & Providence Railroad.....	2,000.00
	<hr/>
	\$15,000.00

## SHERMAN FUND.

(Legacy of Mrs. Fanny Sherman, of Exeter.)

Old Colony Railroad bond.....	\$1,000.00
City of Cleveland (Ohio) bonds.....	3,000.00
Northern Pacific-Great Northern Railroad bond (Chicago, Burlington & Quincy Railroad, joint 4s) .....	1,000.00
	<hr/>
	\$5,000.00

## SMITH FUND.

(Legacy of Betsey Smith, of Hanover.)

New York, New Haven & Hartford Railroad, Harlem River & Port Chester Division bond..	\$500.00
---	----------

## SPALDING FUND.

(Legacy of Isaac Spalding, of Nashua.)

Concord & Montreal Railroad bonds.....	\$6,000.00
Boston & Providence Railroad bonds.....	2,000.00

New York, New Haven & Hartford Railroad bond .....	\$1,000.00
Old Colony Railroad bond.....	1,000.00
	<hr/>
	\$10,000.00

## SPRING FUND.

(Received from sale of spring.)

New York, New Haven & Hartford Railroad, Harlem River & Port Chester Division bond..	\$100.00
1 share Northern (N. H.) Railroad.....	100.00
	<hr/>
	\$200.00

## WALKER FUND.

(Legacy of Abigail B. Walker, of Concord.)

New York, New Haven & Hartford Railroad, Harlem River & Port Chester Division bonds	\$1,500.00
Boston & Maine Railroad bonds.....	5,000.00
Salt Lake City (Utah) bonds.....	1,000.00
Old Colony Railroad bonds.....	4,000.00
25 shares State National Bank, Boston, Mass..	2,500.00
10 shares Northern (N. H.) Railroad.....	1,000.00
	<hr/>
	\$15,000.00

## WILLIAMS FUND.

(Gift of John Williams, of Hanover.)

2 shares Union National Bank of Lowell, Mass.	\$200.00
	<hr/>
Total amount permanent funds.....	\$303,031.92

Respectfully submitted,

(Signed)

W. F. THAYER,

*Financial Agent.*

CONCORD, N. H., August 31, 1909.

I hereby certify that I have examined the foregoing statement of the receipts and expenditures of William F. Thayer, financial agent of the New Hampshire State Hospital, from September 1, 1908, to August 31, 1909, and find the same correctly cast, and sustained by proper vouchers, and the balance in his hands to be \$3,788.65.

I have compared the foregoing list of securities with the securities in his hands and find same to agree in all particulars.

(Signed)

WM. PARKER STRAW,

*Auditor.*

NOVEMBER 9, 1909.

I hereby certify that I have this day examined the securities listed in the foregoing statement and find them in the custody of said Wm. F. Thayer, to wit, to the amount of two hundred sixty-nine thousand nine hundred dollars (\$269,900), together with a memorandum of the state treasurer as to the Fiske and Kimball legacies, amounting to thirty-three thousand one hundred thirty-one and ninety-two one hundredths dollars (\$33,131.92), which constitute a part of the total permanent funds of three hundred three thousand thirty-one and ninety-two one hundredths dollars (\$303,031.92), held in trust for the benefit of the New Hampshire State Hospital.

(Signed)

W. B. FELLOWS,

*State Auditor.*

NOVEMBER 19, 1909.

# REPORT OF THE FINANCIAL AGENT.

September 1, 1909, to August 31, 1910.

## RECEIPTS.

Balance on hand September 1, 1910.....	\$3,788.65
Received from sale 85 shares Boston & Maine Railroad....	\$13,175.00
matured bond, Phila- delphia, Wilming- ton & Baltimore..	12,000.00
interest and dividends	14,037.03
	<hr/>
	39,212.03
	<hr/>
	\$43,000.68

## EXPENDITURES.

Cash paid treasurer towards support of indigent patients, etc.....	\$8,000.00
paid treasurer, for improvement of hos- pital grounds .....	500.00
paid treasurer, for income of Conant fund	294.50
paid treasurer, for income of Adams fund	147.00
paid treasurer, account sundry appropria- tions by vote trustees.....	878.27
paid for 65 shares Concord & Montreal Railroad stock .....	13,639.66
paid for \$12,000 Boston & Maine Railroad 4½s .....	12,466.50
paid Rumford Printing Company, for in- vestment register .....	23.50
paid Hutchinson Building Company, as per vote of trustees .....	567.57



Cash paid premium surety bond.....	\$75.00
paid for real estate purchased.....	1,000.00
paid Merrimack county registry of deeds	2.30
paid for boiler insurance.....	84.90
paid W. F. Thayer, financial agent.....	575.00
	<hr/>
	\$38,254.20
Balance on hand August 31, 1910.....	4,746.48
	<hr/>
	\$43,000.68

I have this day examined the within account and find proper vouchers for all the expenditures, and find a cash balance in the hands of the financial agent, August 31, 1910, of forty-seven hundred forty-six and forty-eight one hundredths dollars (\$4,746.48).

(Signed)

W. B. FELLOWS,

*State Auditor.*

NOVEMBER 10, 1910.

(Signed)

WM. PARKER STRAW,

*Auditor State Hospital.*

NOVEMBER 14, 1910.

The following were the several permanent funds of the hospital on the first day of September, 1910, accompanied by a list of the securities in which they are invested:

#### ADAMS FUND.

(Gift of Isaac Adams, of Sandwich.)

New York, New Haven & Hartford Railroad,	
Harlem River & Port Chester Division bond	\$400.00
Iowa Loan & Trust Company bond.....	1,000.00
City of Concord (N. H.) bonds.....	600.00
10 shares Pittsburg, Fort Wayne & Chicago Rail-	
road .....	1,000.00
	<hr/>
	\$3,000.00

## BURROUGHS FUND.

(Legacy of Rev. Charles Burroughs, D. D., of Portsmouth.)

Northern Pacific-Great Northern Railroad bond (Chicago, Burlington & Quincy Railroad, joint 4s) .....	\$1,000.00
---	------------

## CHANDLER FUND.

(Legacy of Abiel Chandler, of Walpole.)

Chicago & Northwestern Railroad bond (Mil- waukee, Lake Shore & Western).....	\$1,000.00
Iowa Loan & Trust Company bonds.....	800.00
New York, New Haven & Hartford Railroad bonds .....	2,000.00
Old Colony Railroad bond.....	1,000.00
Boston & Lowell Railroad bond.....	5,000.00
Concord & Montreal Railroad bonds.....	2,000.00
Boston & Maine Railroad bonds.....	8,000.00
62 shares Concord & Montreal Railroad.....	6,200.00
10 shares Michigan Central Railroad.....	1,000.00
10 shares Pittsburg, Fort Wayne & Chicago Rail- road .....	1,000.00
3 shares State National Bank, Boston, Mass....	300.00
17 shares Northern (N. H.) Railroad.....	1,700.00
	<hr/>
	\$30,000.00

## CONANT FUND.

(Legacy of John Conant, of Jaffrey.)

Concord & Montreal Railroad bonds.....	\$2,000.00
Iowa Loan & Trust Company bonds.....	4,000.00
2 shares Boston & Providence Railroad.....	200.00
3 shares Concord & Montreal Railroad.....	300.00
	<hr/>
	\$6,500.00

## CREIGHTON FUND.

(Legacy of Mrs. S. E. W. Creighton, of Newmarket.)

Boston & Providence Railroad bonds.....	\$1,000.00
Boston & Maine Railroad bonds.....	2,000.00
	<hr/>
	\$3,000.00

## DANFORTH FUND.

(Legacy of Mary Danforth, of Boscawen.)

City of Concord (N. H.) bonds.....	\$400.00
------------------------------------	----------

## FISK FUND.

(Legacy of Miss Catharine Fisk, of Keene.)

Fisk fund held in trust by the state.....	\$26,378.43
---	-------------

## FULLER FUND.

(Legacy of Mrs. Peggy Fuller, of Francestown.)

20 shares Concord & Montreal Railroad.....	\$2,000.00
--	------------

## KENT FUND.

(Legacy of Moody Kent, of Pittsfield.)

Boston & Maine Railroad bonds.....	\$12,000.00
City of Concord (N. H.) bonds.....	200.00
City of Minneapolis (Minn.) bonds.....	3,000.00
Oregon Short Line Railroad bonds.....	5,000.00
New York, New Haven & Hartford Railroad bonds .....	6,000.00
Chicago, Burlington & Quincy Railroad bonds..	10,000.00
Chicago & Northwestern Railroad bonds.....	9,000.00
Boston & Lowell Railroad bonds.....	15,000.00
Concord & Montreal Railroad bonds.....	8,000.00
City of Duluth (Minn.) bonds.....	7,000.00
Northern Pacific Railway bonds.....	5,000.00
St. Joseph & Grand Island Railroad bonds.....	5,000.00

Old Colony Railroad bonds.....	\$12,000.00
Northern Pacific-Great Northern Railroad bonds (Chicago, Burlington & Quincy Railroad, joint 4s) .....	13,000.00
Union Pacific Railroad bonds.....	1,000.00
50 shares Pittsburg, Fort Wayne & Chicago Rail- road .....	5,000.00
7 shares Union National Bank, Lowell, Mass...	700.00
47 shares State National Bank, Boston, Mass...	4,700.00
70 shares St. Joseph & Grand Island Railroad, first preferred .....	7,000.00
25 shares St. Joseph & Grand Island Railroad, second preferred .....	2,500.00
42 shares Northern (N. H.) Railroad.....	4,200.00
100 shares Michigan Central Railroad.....	10,000.00
2 shares Boston & Providence Railroad.....	200.00
50 shares Fitchburg (Mass.) National Bank....	5,000.00
	<hr/>
	\$150,500.00

## KIMBALL FUND.

(Legacy of Jacob Kimball, of Hampstead.)

Kimball fund held in trust by the state treasurer \$6,753.49

## LOW FUND.

(Legacy of Abiel A. Low, of Brooklyn, N. Y.)

City of Columbus (Ohio) bonds.....	\$3,000.00
City of Chicago (Ill.) bonds.....	2,000.00
	<hr/>
	\$5,000.00

## PENHALLOW FUND.

(Legacy of H. Louise Penhallow, of Portsmouth.)

Concord &amp; Montreal Railroad bond..... \$1,000.00

## PIPER FUND.

(Legacy of Rhoda C. Piper, of Hanover.)

1 share Union National Bank, Lowell, Mass.... \$100.00

## PLUMMER FUND.

(Legacy of William Plummer, of Londonderry.)

New York, New Haven & Hartford Railroad, Harlem River & Port Chester Division bond..	\$500.00
---	----------

## RICE FUND.

(Legacy of Arabella Rice, of Portsmouth.)

Oregon Short Line Railroad bonds.....	\$5,000.00
Old Colony Railroad bonds.....	3,000.00
Chicago & Northwestern Railroad bond.....	1,000.00
Old Colony Railroad registered bond.....	3,000.00
Concord & Montreal Railroad bond.....	1,000.00
Boston & Providence Railroad bond.....	1,000.00
City of Cleveland (Ohio) bonds.....	2,000.00
Union Pacific Railroad bonds.....	5,000.00
	<hr/>
	\$21,000.00

## RUMFORD FUND.

(Legacy of the Countess of Rumford, of Concord.)

Boston & Maine Railroad bonds.....	\$5,000.00
Concord & Montreal Railroad bonds.....	5,000.00
30 shares Pittsburg, Fort Wayne & Chicago Rail- road .....	3,000.00
20 shares Boston & Providence Railroad.....	2,000.00
	<hr/>
	\$15,000.00

## SHERMAN FUND.

(Legacy of Mrs. Fanny Sherman, of Exeter.)

Old Colony Railroad bond.....	\$1,000.00
City of Cleveland (Ohio) bonds.....	3,000.00
Northern Pacific-Great Northern Railroad bond (Chicago, Burlington & Quincy Railroad, joint 4s) .....	1,000.00
	<hr/>
	\$5,000.00



## SMITH FUND.

(Legacy of Betsey Smith, of Hanover.)

New York, New Haven & Hartford Railroad, Harlem River & Port Chester Division bond..	\$500.00
---	----------

## SPALDING FUND.

(Legacy of Isaac Spalding, of Nashua.)

Concord & Montreal Railroad bonds.....	\$6,000.00
Boston & Providence Railroad bonds.....	2,000.00
New York, New Haven & Hartford Railroad bond .....	1,000.00
Old Colony Railroad bond.....	1,000.00
	<hr/>
	\$10,000.00

## SPRING FUND.

(Received from sale of spring.)

New York, New Haven & Hartford Railroad, Harlem River & Port Chester Division bond..	\$100.00
1 share Northern (N. H.) Railroad.....	100.00
	<hr/>
	\$200.00

## WALKER FUND.

(Legacy of Abigail B. Walker, of Concord.)

New York, New Haven & Hartford Railroad, Harlem River & Port Chester Division bonds	\$1,500.00
Boston & Maine Railroad bonds.....	5,000.00
Salt Lake City (Utah) bonds.....	1,000.00
Old Colony Railroad bonds.....	4,000.00
25 shares State National Bank, Boston, Mass..	2,500.00
10 shares Northern (N. H.) Railroad.....	1,000.00
	<hr/>
	\$15,000.00

## WILLIAMS FUND.

(Gift of John Williams, of Hanover.)

2 shares Union National Bank of Lowell, Mass.      \$200.00

Total amount permanent funds..... \$303,031.92

Respectfully submitted,

W. F. THAYER,

*Financial Agent.*

CONCORD, N. H., August 31, 1910.

I hereby certify that I have this day examined the securities listed in the foregoing statement and find them in the custody of said William F. Thayer, to wit, to the amount of two hundred sixty-nine thousand nine hundred dollars (\$269,900) face value, together with a memorandum of the state treasurer as to the Fiske and Kimball legacies, amounting to thirty-three thousand one hundred thirty-one and ninety-two one hundredths dollars (\$33,131.92), which constitute a part of the total permanent funds of three hundred and three thousand thirty-one and ninety-two one hundredths dollars (\$303,031.92), held in trust for the benefit of the New Hampshire State Hospital, and I find a cash balance in the hands of said Wm. F. Thayer, August 31, 1910, of four thousand seven hundred forty-six and forty-eight one hundredths dollars (\$4,746.48).

(Signed)

W. B. FELLOWS,

*State Auditor.*

NOVEMBER 10, 1910.

(Signed)

WM. PARKER STRAW,

*Auditor State Hospital.*

NOVEMBER 14, 1910.

## REPORT OF THE TRUSTEES.

---

*To His Excellency the Governor and the Honorable Council:*

The trustees of the New Hampshire State Hospital present their sixtieth report.

In prior reports the trustees of this state institution have traced its history from its small beginning in 1842 down to the time of such report, so the trustees respectfully refer you to those reports for evidence of what the hospital has been in the past.

We are led to believe that very few indeed have any conception of just what this state hospital is today, and so we think it will be of service to recount to you at this time its various lands and buildings.

The hospital grounds proper contain about one hundred and twenty-five acres, on which are located the main administration building, with additions thereto, and other main hospital and farm buildings.

The administration building proper contains the administration offices, the residential apartments of the superintendent, and the quarters of physicians and other employees.

Annexed thereto on the south are the Fisk and Rumford wings, and on the north are the Kimball and Chandler wings. These four wings contain individual sleeping rooms for patients, with day wards, and the normal capacity of them together is three hundred.

In the rear of the administration building is the so-called chapel building, containing a chapel, a patients' sewing room, and the main kitchen of the entire hospital.

Annexed to the Chandler wing on the north is the North Pavilion, and annexed to the Rumford wing on the south is the South Pavilion. These two additions are built on the

dormitory and day-room plan, the dormitory being on the second floor and the day room on the first floor. The normal capacity of the north pavilion (male) is 100, and that of the south pavilion (female) is 40.

Annexed to the Chandler wing on the west is the Peaslee building, and to the Rumford wing on the west is the Kent building. These two buildings are constructed on the individual sleeping-room and day-ward plan, and the normal capacity of the Peaslee building (male) is 45, and of the Kent building (female) is 27.

Annexed to the Peaslee building is the Peaslee Annex, and annexed to the Kent building is the Kent Annex (1907). These also are on the sleeping-room and day-ward plan, and the capacity on the male side is 45, and on the female side is 86.

South of this group of connected buildings is located the Bancroft building for convalescent female patients, and north of the group is located the Twitchell house for convalescent male patients.

These separate buildings are on the sleeping-room and day-ward plan, and their capacity is 39 for the Bancroft building and 30 for the Twitchell house.

Between the main connected group and the Bancroft building is the nurses' home, accommodating about 45 nurses.

In 1905 was built a separate building for the care of sick patients, called the Hospital Building, with a normal capacity of 156.

Annexed to the Chandler wing, on the south, is the one-story laundry building; annexed to the chapel building, on the west, are the bakery and laundry and kitchen help dormitories, and annexed to the chapel building, on the south, are the stores building and the main dining-room for the employees.

In the rear and to the west of these buildings are the engineer's house, the stable, and the old heating plant.

Located toward the southwest of the tract of land are the cow barn, piggery, storehouse, sheds, and two cottages for employees, all used in connection with the farming lands.

All of the hospital buildings, except the farm buildings, are connected by subways for communication, which also carry the heat, water, and electric mains.

The legislature of 1909 appropriated eighty-five thousand dollars for the purpose of building a new heat, light, and power plant (Chap. 133, Laws of 1909), the old heating plant having then served the institution beyond the length of time to be expected of it.

The trustees examined the most modern of such institutional plants; the engineer for the hospital drew plans and specifications for the building and coal pocket, which were, with minor changes, approved by Kendall & Taylor, eminent architects and authorities on hospital construction, and a cement coal pocket of two thousand tons capacity was built, on which the coal teams can drive and dump from the top, and a brick building was erected to contain the battery of boilers, an engine room and a machine shop, with engineer's office and storeroom connected.

This building is most modern throughout, the battery of boilers consisting of five 150-horse power Hodge boilers, and the engine room containing, besides the pump, three Ridgeway engines of 150, 115, and 42-horse power, and three Westinghouse generators of 100, 75, and 25 kilowatts. The engine room also contains the hot water heaters for the entire hospital, and the refrigeration machine.

This plant will serve the same purpose for the hospital that the plant at Hanover serves for Dartmouth College, easily producing all the heat, light, and power which the institution will require for some time to come, and its entire equipment is first class and right down to date, selected and installed under the expert advice of Mr. R. D. Kimball, of Boston, and under the direction of the present engineer, Mr. Moore.

The heat, light, and power plant is the heart of the mechanical part of the hospital, and the trustees feel secure in their belief that it is sound.

In 1890 the hospital started its farm colony for remedial



treatment of certain classes of male patients and for the raising of farm produce.

This has extended, until today the state owns a 50-acre pasture on Bog road, so called; one tract of 53 acres on the west shore of Penacook lake; a 90-acre farm, called the Morgan farm; an 80-acre farm, called "Sunnyside"; and 30 acres of tillage, called the Abbot land.

There are no buildings on the Morgan and Abbot lands, they being operated from a set of farm buildings with a patients' dormitory addition located on Sunnyside farm.

On the tract on the west shore of Penacook lake are the Walker (female) and the Richards (male) cottages for outdoor summer use of convalescent patients.

The state also owns a tract of land adjoining the Northern Railroad tracks, which was formerly the site of a coal pocket, but which has been in disuse for a number of years, and since it was destroyed by fire, and which the trustees would recommend that the state sell whenever a customer for it appears.

The trustees have felt for a long time that the hospital should not be called upon to attempt to properly care for a certain class of dangerous insane criminals without adequate facilities for its protection and for the protection of the public.

Accordingly, the trustees consulted with the governor and council, and it was decided that, inasmuch as there are not a sufficient number of this class in the state as yet to warrant either the establishment of a separate institution for the criminal insane, such as larger states have, or the erection by us of a special building for this class, a ward should be selected and fitted for the detention of insane criminals as best it might be.

The trustees have selected the second floor of the Peaslee building for this purpose and are in process of installing new locks and jail guard windows therein, and have erected two high walls enclosing airing courts for these patients.

In 1903 the state first assumed the duty of caring for and

treating all insane persons who were then cared for at the county almshouses (Chap. 61, Laws of 1903) providing in the act that the transfers to the State Hospital should be made as rapidly as accommodations at the hospital could be provided, such transfers to be complete by January 1, 1909.

The Hospital Building and the Peaslee Annex and the Kent Annex were built, but still it became necessary in 1909 to extend the time for the completion of the transfers to January 1, 1913 (Chap. 29, Laws of 1909).

There still remain to be transferred from the county almshouses 124 patients as follows: Rockingham, 26; Belknap, 4; Carroll, 2; Merrimack, 11; Hillsborough, 43; Cheshire, 23; Sullivan, 7; Grafton, 1, and Coös, 7.

Reference to this report shows that the normal, that is, the not too much overcrowded, patient capacity of the hospital is 868, and reference to the superintendent's report shows that the number of patients in the institution has fluctuated during the past year from about 890 to 910.

This means that the hospital is today housing an excessive number of patients, though as yet not unreasonably excessive, and that it has not, and cannot, without additional facilities, comply with the Laws of 1903 and 1909 just referred to.

The increase in the number of patients in the hospital since 1903 is abnormal, to be sure, but it is caused by three different things, an analysis of which will tend to allay fears that the rate of increase will continue until the state cannot reasonably stand the burden.

The largest of the three items is the passage of the acts under which the state has been taking over insane persons previously cared for by the counties; the second item is the consequent direct commitment to the hospital of those insane persons who would otherwise have been committed to the various county almshouses since 1903; and the third item is the natural increase of insanity in the state by reason of increase and change of population.

If the last item itself is not abnormal, then the abnormal

increase in the number of hospital patients need cause no fear. As to whether the last item is probably abnormal is a much discussed question in most of the states.

The trustees have diligently studied the question of what their recommendations ought to be in view of the unreasonable overcrowding of the hospital, which is inevitably close at hand, and have concluded that it is necessary that a new building should be provided for by the incoming legislature, or that the duty of the care and treatment of certain classes of indigent insane cases, which the state has heretofore assumed, should be thrown back again upon the various counties.

The trustees feel that the decision between these two methods of solving the problem which is at hand for solution must be made by the legislature without further recommendation than to say that an examination of the policies of other states in the matter shows that they believe in and carry out the assumption of the duty of caring for all insane persons by the state.

Believing that the legislature will probably take no retrogressive step in this matter, the trustees have carefully considered the question of just what a new building should be, and where it should be located.

Reference to this report again shows that building after building and wing after wing have been annexed to previous construction, and a critical examination of the surroundings of the hospital's buildings shows that it is practically impossible to annex any more.

The contour of the hospital grounds is such that the trustees believe that the time has come to build a new unit on the west portion of the grounds, which is the most available location for any new construction.

The trustees appointed a committee to examine the most recent construction in insane hospitals in other states, and this committee, after making inquiries, went to Poughkeepsie, N. Y., and to Norwich, Conn., in both of which places new buildings of the most approved types were inspected.

The committee procured, through the courtesy of the New York officials, the plans of a four hundred capacity building, which has been so successful in operation that the state of New York has built two others from the same plans.

This building is built in the shape of a Maltese cross, and is on the dormitory and day-room plan, containing house physician offices and quarters, kitchen, and male and female wings.

The trustees recommend the erection and equipment of a building of large capacity, because it is to be expected that by the time such new building is ready for occupancy there will be about two hundred patients ready to occupy it, made up by completion of transfers from county almshouses and by the natural increase, as already noted.

We have decided to ask the legislature to carefully consider the advisability of erecting a building like those built in New York.

During the past two years there have been two changes in the board, caused by the expiration of the term of service of Dr. Morris Christie, who, we regret to say, is suffering from impaired health, and by the election of Hon. Henry B. Quinby to the office of governor of the state.

The absence of these two men from the board of trustees is a genuine loss to the hospital.

Respectfully submitted,  
JOHN A. SPALDING,  
WILLIAM F. THAYER,  
EDGAR O. CROSSMAN,  
GEORGE W. PIERCE,  
JOHN McCRILLIS,  
WILLIAM PARKER STRAW,  
GEORGE M. KIMBALL,  
ROGER G. SULLIVAN,  
HENRY W. ANDERSON,  
BENJAMIN W. COUCH,  
GEORGE H. SALTMARSH,  
FRED S. TOWLE,

*Trustees of New Hampshire State Hospital.*

CONCORD, N. H., November 16, 1910.

## REPORT OF THE SUPERINTENDENT.

---

The superintendent respectfully presents the sixty-seventh and sixty-eighth annual reports for the biennial period ending August 31, 1910.

The year beginning September 1, 1908, commenced with 831 patients, 453 men and 378 women. The number of patients remaining August 31, 1909, was 875, 464 men and 411 women.

The daily average for the year ending August 31, 1909, was 864.33, 465.17 men and 399.16 women.

The mortality rate for this same period was ten percent.

The recovery rate for this same period based on the number of different persons admitted was 16.31, excluding all recoveries from alcoholism or other drug habit.

The year beginning September 1, 1909, commenced with 875 patients, 464 men and 411 women. The number of patients remaining August 31, 1910, was 909, 483 men and 426 women.

The daily average for the year ending August 31, 1910, was 888.23, 467.08 men and 421.15 women.

The mortality rate of this same period was eleven percent.

The recovery rate for this same period based on the number of different persons admitted and excluding all cases of alcoholism or other drug habit was 17.46 percent.

The mortality rate is high, and the recovery rate rather low. Both these results are due to the hopeless character of the cases admitted, and the preponderance of organic and incurable types of brain disease over purely functional and curable forms of insanity. Of the 580 different insane persons admitted during the biennial period 352 or 60.68 percent were suffering from structural brain disease or from such



type of insanity as not only precluded recovery but was fatal in itself to life. Since the hospital has been receiving all classes of cases throughout the state, the preponderance of incurable and organic brain diseases has steadily lowered the recovery rate. This result, though statistically discouraging, is to be expected and does not indicate that treatment has been any the less efficient among such cases as are hopeful. Based on the number of hopeful cases admitted each year, the results are gratifying. In addition to the recoveries one must not lose sight of those cases that are discharged in various stages of improvement, many of whom are capable of self support outside the institution.

The wards of the annex to the Kent building were opened for the reception of patients in February, 1909, and those of the Peaslee annex in March, 1909. These additions have proved of the greatest value to the hospital in facilitating its classification of patients. By their location and arrangement, patients of the disturbed class can be so far removed from others as to materially diminish the annoyance arising from their special symptoms.

At the request of the governor and council, estimates were procured for still further strengthening certain wards of the Peaslee Annex, and rendering escape less easy for the criminal class. Such provision, including special guards for windows, new and modern locks for doors, to replace the more antique and less secure locks now in use, and a high wall enclosing an airing court for the use of the criminal insane with dangerous tendencies will cost about \$4,312. By especial vote of the council the trustees were granted permission to use a sufficient sum from the maintenance appropriation to make these changes. The walls are already erected, the locks are being put in place and the guards are being installed.

The purchase of land at Lake Penacook has proved of great economic value to the hospital. During the last two years 2,800 bushels of potatoes were raised at this farm, besides 5,734 dozen eggs, and 120 gallons of maple syrup. Sev-



enteen head of young stock were cared for at Sunnyside. The governor and council in the spring of 1910 authorized the purchase of thirty acres adjacent to the Lake Penacook property. This land is already being prepared for the raising of potatoes for next year. With all food products at their present high prices, the acquisition of farming land for the raising of milk, potatoes, and eggs is greatly to be desired. Such an investment will yield a good return to the hospital in stable food supplies, besides proving of great remedial value to the patients thus employed. The land can be economically farmed by the labor of patients. This policy of acquiring farm land for the establishment of working colonies of patients has been carried out in Massachusetts and New York state at the various state hospitals, and has proved of the greatest economic value. It is to be hoped that a similar policy may prevail in this state. As rapidly as possible the state should acquire more land in connection with the Sunnyside and Lake Penacook property. A good beginning has been made, and the cost of maintenance will be light, as the hospital already possesses good buildings in the locality.

The need of a detached isolation hospital was demonstrated during the year 1909. During that year there occurred three cases of diphtheria and one of scarlet fever, all among employees; they were cared for at the contagious hospital in the city. At the present time there are two mild cases of typhoid fever in patients in the hospital.

The most pressing need at the present time is for additional buildings, not only to relieve overcrowding from the ordinary natural increase in patients but to enable the hospital to comply with the law requiring transfer of all insane patients from the county farms by 1913. Your committee appointed by the full board to visit other hospitals and procure plans and estimates for new construction visited the Norwich State Hospital in Connecticut and the Hudson River State Hospital at Poughkeepsie, New York. Plans and estimates for a detached unit embodying the result of their observation and modified to meet the conditions in our state

have been prepared for your approval. It seemed to your committee that a group constructed on the lines of these plans would be as inexpensive as is consistent with safety and would prove economical in administration.

The last legislature appropriated eighty-five thousand dollars for the erection of a new boiler house and coal bunker, electric light and power plant, and new floors and plumbing in the Peaslee building. These additions and improvements are well under way. In the financial report of the building committee will be found the itemized list of expenditures from this appropriation to date. The advisability of installing an electric plant has been questioned in view of the low rate offered by the local electric company. The reports of Mr. Hunter of Dartmouth College and of the R. D. Kimball Company of Boston confirm the conclusion that it will be more economical for the hospital to furnish its own electric light and power.

The eight-inch water main has been extended to the barn and hydrants placed at proper points near the buildings. Hydrants are now located at accessible places about all the main and outbuildings.

A Star Milk Cooler has been installed at the cow barn, under as perfect conditions as possible for cleanliness.

New floors have been laid in wards 13 and 1, in ten single rooms in the Kent building, and in seven rooms in the Bancroft building. Many steel ceilings have been placed instead of lath and plaster ceilings. A fire wall with tinned doors has been erected between the Kent and Rumford wings. Tinned doors have been placed in the subways leading to the Nurses' Home, Bancroft building, Twitchell house, and Peaslee Annex. A new toilet room has been provided for the outdoor court between the Peaslee building and the North Pavilion.

As rapidly as is possible, weak points in the old electric wiring have been repaired and replaced with safer appliances, in accordance with the more recent underwriters' rules. Wards 15, 3, 6, and 9 have been thus changed, iron conduit

and rubber-covered wire taking the place of the wooden mouldings and weather-proof wire. In the basement, large iron conduits have replaced the old original conduit. As the hospital is to have its own electric light plant, the entire distribution of mains throughout the basements will probably require renewal.

Four painters have been constantly employed in repainting both inside and outside the various buildings, as well as in refinishing hospital furniture. They have been assisted in the work by several patients.

Four and five carpenters have been constantly employed in making necessary repairs.

Under supervision many patients have been engaged in placing concrete floors in the basements, new coal bunkers, outside courts, and sidewalks.

It has been necessary during the past year to purchase five horses to replace others. The time is opportune for the purchase of a motor truck. The demand upon the farm horses is excessive, and, with the steadily increasing amount of transportation of coal and freight such a truck would be of distinct economic value to the hospital.

The insect pests in the elms and oaks have become a serious menace to our beautiful shade trees. During the last summer the elm tree beetle appeared and completely defoliated many of the finest trees. The loss of our shade trees would be nothing short of a calamity, and I earnestly recommend the purchase of a suitable power-spraying machine for use during the following summer.

In April, 1909, the training school entered upon affiliated relations with the Bellevue and Allied Hospitals of New York City, and three nurses finished their course in that hospital last October, with credit to themselves and for the future advantage of this hospital. A third division of three nurses has already entered upon this service. The nurses, as they return to the State Hospital, bring added experience to their work, and render the securing of capable nurses for our own hospital service less difficult.

In October, 1909, Miss Ada Van Vranken, superintendent of nurses for the past five years, resigned to take a government position in Alaska. Miss Van Vranken was an excellent instructor, and brought much enthusiasm to her work. Through her zeal, the affiliation with Bellevue Hospital was successfully consummated. Miss Van Vranken's position has been filled by the appointment of Miss Etta May Bagley, a graduate of the Massachusetts General and McLane Hospital training schools, and brings to her new work a fine experience derived in the best training schools of the country.

Mr. Frederick Booth, for nearly twenty years engineer at the hospital, resigned his position. His place has been most acceptably filled by Mr. William F. Moore, who has had several years engineer's experience in other institutions.

During 1909 Dr. Thomas Littlewood resigned from the position of fourth assistant physician to take the place of first assistant physician at the Massachusetts State Colony at Gardner. He was succeeded by Dr. E. A. Bullard, recently graduated from the Dartmouth Medical School. Dr. Bullard was succeeded by Dr. M. H. Towle. Dr. G. B. Landers, after faithful service of four years, resigned his position to accept that of first assistant physician at the Brattleboro Retreat. His service at this hospital was most satisfactory. Dr. Landers was succeeded by Dr. M. H. Langill during the summer months, who resigned to take the internship at the Mary Hitchcock Hospital at Hanover. Dr. Langill was succeeded by Dr. A. B. Howard. All of these gentlemen have been faithfully devoted to their work.

CHARLES P. BANCROFT, *M. D.*

CONCORD, N. H., November 17, 1910.

# STATISTICAL TABLES FOR THE YEAR ENDING AUGUST 31, 1909.

TABLE I.

	Men.	Women.	Total.
Patients in hospital September 1, 1908. ....	453	378	831
Cases admitted during the year. ....	167	125	292
Discharged within the year, including deaths. ....	156	92	248
" recovered from first attack. ....	17	18	35
" recovered from other than first attack. ....	4	8	12
" recovered from alcoholism. ....	18	9	18
" much improved. ....	19	10	29
" improved. ....	6	8	14
" not improved. ....	6	13	19
" not insane. ....	3	1	4
Absconded. ....	5	0	5
Deaths. ....	78	34	112
Patients remaining September 1, 1909. ....	464	411	875
Number of different persons under treatment during the year. ....	615	499	1,114
Number of different persons admitted during the year. ....	164	124	288
Number of different persons recovered during the year. ....	39	25	64
Daily average number of patients. ....	465.17	399.16	864.33

TABLE II.

*Showing results in all under treatment during the year.*

	Of those in the hospital at the beginning of the year.			Of those admitted during the year.			Total of both classes.		
	Men.	Women.	Total.	Men.	Women.	Total.	Men.	Women.	Total.
Discharged recovered. ....	11	11	22	10	15	25	21	26	47
" much improved. ....	13	7	20	6	3	9	19	10	29
" improved. ....	3	3	6	3	5	8	6	8	14
" not improved. ....	2	2	4	4	11	15	6	13	19
" alcoholism. ....	0	0	0	18	0	18	18	0	18
" absconded. ....	2	0	2	3	0	3	5	0	5
" not insane. ....	1	0	1	2	1	3	3	1	4
Deaths. ....	59	17	76	19	17	36	78	34	112
Remaining improved. ....	12	21	33	30	26	56	42	47	89
Remaining not improved. ....	351	317	668	71	47	118	422	364	786

TABLE III.

*Admissions and discharges from beginning of the hospital.*

	Men.	Women.	Total.
Admitted .....	5,041	4,619	9,660
Discharged .....	4,577	4,208	8,785
" recovered .....	1,414	1,377	2,791
" improved .....	1,029	1,026	2,055
" not improved .....	871	864	1,735
" not insane .....	44	26	70
" unknown .....	49	39	88
Abandoned .....	62	4	66
Died .....	1,108	872	1,980

TABLE IV.

*Showing number and character of those recovered during the year.*

	Cases in which recurrence is established.			Cases in which recurrence is not established.			Total of both classes.		
	Men.	Women.	Total.	Men.	Women.	Total.	Men.	Women.	Total.
From first attack .....				29	16	45	29	16	45
" second attack .....				4	4	8	4	4	8
" third attack .....	2	0	2	3	2	5	5	2	7
" fourth attack .....	0	2	2	1	0	1	1	2	3
" ninth attack .....	0	1	1				0	1	1
" tenth attack .....	0	1	1				0	1	1
Total .....	2	4	6	37	22	59	39	26	65

TABLE V.

*Showing duration of insanity in those recovered during the year.*

	Men.	Women.	Total.
Under one month .....	27	15	42
One to three months .....	4	5	9
Three to four months .....	3	1	4
Four to six months .....	1	1	2
Six to twelve months .....	1	1	2
More than one year .....	3	3	6
Total .....	39	26	65



TABLE VI.

*Showing number of admissions to this hospital in those admitted during the year.*

	Men.	Women.	Total.
Admitted the first time .....	135	98	233
“ second time .....	19	12	31
“ third time .....	8	9	17
“ fourth time .....	2	2	4
“ fifth time .....	1	1	2
“ sixth time .....	0	1	1
“ seventh time .....	0	1	1
“ eighth time .....	1	0	1
“ ninth time .....	0	1	1
“ tenth time .....	1	0	1
Total .....	167	125	292

TABLE VII.

*Showing number of attacks in those admitted during the year.*

	Men.	Women.	Total.
First .....	133	88	227
Second .....	16	16	32
Third .....	6	13	19
Fourth .....	3	6	9
Fifth .....	1	0	1
Sixth .....	0	0	0
Seventh .....	0	0	0
Eighth .....	1	0	1
Ninth .....	0	1	1
Tenth .....	1	1	2
Total .....	167	125	292

TABLE VIII.

*Showing duration of insanity in those admitted during the year.*

	Men.	Women.	Total.
Less than one month .....	66	37	103
One to three months .....	20	17	37
Three to six months .....	18	9	27
Six to nine months .....	5	11	16
Nine to twelve months .....	2	2	4
Twelve to eighteen months .....	12	11	23
Eighteen months to two years .....	1	1	2
Two to three years .....	7	6	13
Three to four years .....	8	3	11
Four to five years .....	2	6	8
Five to ten years .....	2	4	6
Ten to fifteen years .....	4	6	10
Fifteen to twenty years .....	5	1	6
Twenty to thirty years .....	3	0	3
Over thirty years .....	3	0	3
Unknown .....	7	11	18
Not insane .....	2	0	2
Total .....	167	125	292

TABLE IX.

*Showing ages of those admitted during the year.*

	Men.	Women.	Total.
Ten to fifteen years.....	1	1	2
Fifteen to twenty years.....	9	3	12
Twenty to twenty-five years.....	8	7	15
Twenty-five to thirty years.....	23	10	33
Thirty to thirty-five years.....	14	13	27
Thirty-five to forty years.....	18	19	37
Forty to forty-five years.....	20	8	28
Forty-five to fifty years.....	15	17	32
Fifty to sixty years.....	24	22	46
Sixty to seventy years.....	14	10	24
Seventy to eighty years.....	15	11	26
Eighty to ninety years.....	3	4	7
Ninety to one hundred years.....	3	0	3
Total .....	167	125	292

TABLE X.

*Showing form of disease in those admitted during the year.*

	Men.	Women.	Total.
Acute alcoholism.....	22	0	22
Chronic alcoholism.....	3	0	3
Alcoholic delusional insanity.....	7	2	9
Chronic ".....	2	5	7
Manic depressive ".....	28	47	75
Acute confusional ".....	2	1	3
Presenile delusional ".....	0	3	3
Moral ".....	0	1	1
Epileptic ".....	2	0	2
" dementia.....	7	3	10
Senile ".....	20	16	36
Organic ".....	6	7	13
Dementia praecox.....	17	14	31
Involution melancholia.....	9	8	17
Paresis.....	15	5	20
Paranoia.....	9	5	14
Imbecility.....	11	2	13
" with epilepsy.....	0	1	1
Idiocy ".....	1	0	1
Cerebral hemorrhage.....	0	2	2
" syphilis.....	0	1	1
Constitutional psychopathic states.....	1	0	1
Psychasthenia.....	1	0	1
Korsakow's disease.....	1	0	1
Morphinomania.....	0	1	1
Not insane.....	3	1	4
Total .....	167	125	292

TABLE XI.

*Showing possible causes or contributing factors found in cases admitted during the year.*

	Men.	Women.	Total.
Heredity.....	39	37	76
Alcohol.....	46	10	56
Age.....	19	14	33
Ill health.....	3	15	18
Overwork.....	9	8	17
Worry.....	4	7	11
Childbirth and lactation.....	0	11	11
Trauma.....	8	1	9
Menopause.....	0	8	8
Epilepsy.....	5	2	7
Domestic Unhappiness.....	1	5	6
Syphilis.....	4	0	4
Confinement in prison.....	4	0	4
Fright.....	2	0	2
Intermarriage.....	1	0	1
Cerebral hemorrhage.....	0	1	1
Grief.....	0	1	1
Morphine.....	0	1	1
No possible cause shown.....	44	23	67

TABLE XII.

*Showing civil condition of those admitted during the year.*

	Men.	Women.	Total.
Married.....	60	56	116
Single.....	79	45	124
Widowed.....	27	22	49
Divorced.....	1	2	3
Total.....	167	125	292

TABLE XIII.

*Showing occupation of those admitted during the year.*

	Men.	Women.	Total.
Blacksmith.....	2	0	2
Boxmaker.....	0	1	1
Barber.....	1	0	1
Cabinet maker.....	1	0	1
Carpenter.....	4	0	4
Cigar maker.....	1	0	1
Contractor.....	1	0	1
Coachman.....	1	0	1
Chambermaid.....	0	1	1
Dentist.....	1	0	1
Dancing master.....	1	0	1
Dressmaker.....	0	3	3
Electrical engineer.....	1	0	1
Elevator boy.....	1	0	1
Farmer.....	21	0	21
Gardener.....	1	0	1
Housework.....	0	86	86
Hotel Clerk.....	2	0	2
Hotel keeper.....	1	0	1
Horse dealer.....	1	0	1
Iron moulder.....	1	0	1
Lumberman.....	5	0	5
Laborer.....	41	0	41
Lawyer.....	1	0	1
Machinist.....	1	0	1
Mattress maker.....	2	0	2
Merchant.....	1	0	1
Musician.....	2	0	2
Mill op-rative.....	16	13	29
No occupation.....	16	10	26
Nurse.....	0	2	2
Paper hanger.....	1	0	1
Painter.....	5	0	5
Physician.....	1	0	1
Printer.....	2	0	2
Provision dealer.....	1	0	1
Railroad conductor.....	1	0	1
Restaurant keeper.....	1	0	1
Real estate.....	1	0	1
Sales clerk.....	0	1	1
Ship rigger.....	1	0	1
Shoe operative.....	5	3	8
Stenographer.....	0	1	1
Student.....	2	1	3
Stone mason.....	5	0	5
Tailor.....	1	0	1
Teacher.....	2	2	4
Tinsmith.....	1	0	1
Teamster.....	4	0	4
Treasurer.....	1	0	1
Unknown.....	5	1	6
Total.....	167	125	292

TABLE XIV.

*Showing nativity of those admitted during the year.*

	Men.	Women.	Total.
New Hampshire.....	80	65	145
Canada.....	23	14	37
Massachusetts.....	11	8	19
Maine.....	10	8	18
Ireland.....	9	7	16
Vermont.....	8	4	12
New York.....	3	3	6
Nova Scotia.....	1	3	4
Greece.....	2	1	3
Poland.....	2	1	3
England.....	2	1	3
Rhode Island.....	0	2	2
Prince Edward Island.....	2	0	2
Scotland.....	1	1	2
Sweden.....	1	1	2
Quebec.....	1	1	2
Norway.....	1	0	1
Syria.....	0	1	1
Turkey.....	0	1	1
Virginia.....	1	0	1
West Virginia.....	1	0	1
Minnesota.....	0	1	1
South Carolina.....	1	0	1
Ohio.....	1	0	1
California.....	1	0	1
Winnipeg.....	1	0	1
New Brunswick.....	0	1	1
Germany.....	1	0	1
Unknown.....	3	1	4
Total.....	167	125	292

TABLE XV.

*Showing residence of those admitted during the year.*

	Men.	Women.	Total.
Belknap county.....	4	8	12
Carroll ".....	8	4	12
Cheshire ".....	7	8	15
Coos ".....	12	8	20
Grafton ".....	12	17	29
Hillsborough county.....	44	36	80
Merrimack.....	32	19	51
Rockingham ".....	21	13	34
Strafford ".....	17	10	27
Sullivan ".....	8	2	10
Prison transfer.....	2	0	2
Total.....	167	125	292

TABLE XVI.

*Showing by what authority committed.*

	Men.	Women.	Total.
By relatives or friends.....	79	93	172
By county.....	44	22	66
By town or city.....	31	10	41
By governor and council.....	4	0	4
By court.....	9	0	9
Total.....	167	125	292

TABLE XVII.

*Showing by whom supported.*

	Men.	Women.	Total.
Private.....	39	40	79
Private with aid.....	15	18	33
State.....	109	66	175
County.....	1	1	2
Town or city.....	2	.....	2
U. S.....	1	.....	1
Total.....	167	125	292

TABLE XVIII.

*Deaths during the year and their causes*

	Men.	Women.	Total.
Exhaustion in senile dementia.....	10	9	19
“ “ chronic “.....	3	1	4
“ “ secondary “.....	1	1	2
“ “ organic “.....	1	3	4
“ “ acute mania.....	0	1	1
“ “ melancholia.....	0	2	2
“ “ acute confusional.....	0	1	1
“ “ epileptic dementia.....	2	0	2
“ “ dementia praecox.....	1	0	1
Paresis.....	16	2	18
Cerebral hemorrhage.....	6	2	8
Pulmonary tuberculosis.....	13	1	14
Valvular heart disease.....	4	3	7
Organic heart disease.....	3	1	4
Myocarditis.....	3	1	4
Enterocolitis.....	1	0	1
Enteritis.....	2	1	3
Lobar pneumonia.....	2	0	2
Hypostatic pneumonia.....	1	1	2
Suicide by strangulation.....	2	1	3
“ “ cutting throat.....	1	0	1
Gangrene of feet.....	1	0	1
Heat exhaustion.....	1	0	1
Acute alcoholism.....	1	0	1
Sepsis.....	1	0	1
Arterio sclerosis.....	1	0	1
Chronic interstitial nephritis.....	1	2	3
Uraemia.....	0	1	1
Total.....	78	34	112



TABLE XIX.

*Showing ages at time of death.*

	Men.	Women.	Total.
Between twenty and thirty years.....	5	1	6
“ thirty and forty years.....	15	2	17
“ forty and fifty years.....	8	4	12
“ fifty and sixty years.....	18	7	25
“ sixty and seventy years.....	15	6	21
“ seventy and eighty years..	11	19	21
Over eighty years.....	6	4	10
Total.....	78	34	112

TABLE XX.

*Showing ages of those remaining at end of year.*

	Men.	Women.	Total.
Under fifteen years.....	1	1	2
From fifteen to twenty years.....	8	2	10
“ twenty to thirty years.....	57	31	88
“ thirty to forty years.....	108	92	200
“ forty to fifty years.....	103	100	203
“ fifty to sixty years.....	89	76	165
“ sixty to seventy years.....	60	58	118
“ seventy to eighty years.....	30	37	67
Over eighty years.....	4	9	13
Unknown.....	4	5	9
Total.....	464	411	875

TABLE XXI.

*Showing duration of disease in those remaining at end of year.*

	Men.	Women.	Total.
Less than one month.....	1	0	1
From one to three months.....	8	4	12
From three to six months.....	14	15	29
From six to nine months.....	13	7	20
From nine to twelve months.....	15	9	24
From twelve to eighteen months.....	20	16	36
From eighteen months to two years.....	13	8	21
From two to three years.....	23	18	41
From three to four years.....	17	17	34
From four to five years.....	13	21	34
From five to ten years.....	71	82	153
From ten to fifteen years.....	40	40	80
From fifteen to twenty years.....	27	30	57
From twenty to twenty-five years.....	15	22	37
From twenty-five to thirty years.....	20	16	36
From thirty to forty years.....	11	23	34
Over forty years.....	14	13	27
Unknown.....	129	70	199
Total.....	464	411	875

TABLE XXII.

*Showing prospects of recovery in those admitted during the year.*

	Men.	Women.	Total.
Curable.....	43	24	67
Incurable.....	121	101	222
Not insane.....	3	0	3
Total.....	167	125	292

TABLE XXIII.

*Showing prospects of recovery in those remaining at the end of the year.*

	Men.	Women.	Total.
Curable.....	27	20	47
Incurable.....	437	391	828
Total.....	464	411	875

TABLE XXIV.

*Showing contribution of inmates to this hospital during the year in relation to density of population.*

	Men.	Women.	Total.	Ratio to Population.
From cities over 10,000 representing a population of 124,000.....	57	56	113	1-1100
From cities and towns between 10,000 and 5,000, representing a population of 64,000....	16	12	28	1-2300
From towns between 5,000 and 1,000, representing a population of 118,000.....	43	33	81	1-1400
From towns of 1,000 or less, representing a population of 74,000.....	42	19	61	1-1200
Unclassified.....	9	0	9	
Total.....	167	125	292	1-1300

# STATISTICAL TABLES FOR THE YEAR ENDING AUGUST 31, 1910.

TABLE I.

	Men.	Women.	Total.
Patients in hospital September 1, 1909 .....	464	411	875
Cases admitted during the year .....	158	135	293
Discharged within the year, including deaths .....	139	120	259
" recovered from first attack .....	13	26	39
" recovered from other than first attack .....	5	5	10
" recovered from alcoholism .....	17	0	17
" much improved .....	10	10	20
" improved .....	8	5	13
" not improved .....	7	16	23
" not insane .....	2	0	2
Eloped, not returned .....	2	0	2
Deaths .....	75	56	131
Patients remaining September 1, 1910 .....	483	426	909
Number of different persons under treatment during the year .....	616	536	1152
Number of different persons admitted during the year .....	158	134	292
Number of different persons recovered during the year .....	29	19	48
Daily average number of patients .....	467.08	421.15	888.23

TABLE II.

*Showing results in all under treatment during the year.*

	Of those in the hospital at the beginning of the year.			Of those admitted during the year.			Total of both classes.		
	Men.	Women.	Total.	Men.	Women.	Total.	Men.	Women.	Total.
Discharged recovered .....	8	9	17	10	22	32	18	31	49
" much improved .....	9	7	16	1	3	4	10	10	20
" improved .....	3	2	5	5	3	8	8	5	13
" not improved .....	4	5	9	3	11	14	7	16	23
" alcoholism .....	3	0	3	14	0	14	17	0	17
" not insane .....	0	0	0	2	4	6	2	2	4
" absconded .....	1	0	1	1	0	1	2	0	2
Deaths .....	48	35	83	27	21	48	75	56	131
Remaining improved .....	59	35	94	30	20	50	89	55	144
Remaining not improved .....	337	318	655	57	53	110	393	370	763
Remaining not insane .....				1		1	1		1

TABLE III.

*Admissions and discharges from beginning of the hospital.*

	Men.	Women.	Total.
Admitted.....	5,199	4,754	9,953
Discharged.....	4,716	4,328	9,044
Discharged recovered.....	1,443	1,396	2,839
Discharged improved.....	1,053	1,052	2,105
Discharged not improved.....	878	881	1,759
Discharged not insane.....	46	28	74
Discharged unknown.....	49	39	88
Discharged absconded.....	64	4	68
Died.....	1,183	928	2,111

TABLE IV.

*Showing number and character of those recovered during the year.*

	Cases in which recurrence is established.			Cases in which recurrence is not estab- lished.			Total of both classes.		
	Men.	Women.	Total.	Men.	Women.	Total.	Men.	Women.	Total.
From first attack.....				26	25	51	26	25	51
“ second attack.....	1	1	2	2	3	5	3	4	7
“ third attack.....	1	1	2	2	0	2	3	1	4
“ fourth attack.....	1	0	1	0	0	0	1	0	1
“ seventh attack.....	0	1	1	0	0	0	0	1	1
“ eighth attack.....	1	0	1	1	0	1	2	0	2
Total.....	4	3	7	31	28	59	35	31	66

TABLE V.

*Showing duration of insanity in those recovered during the year.*

	Men.	Women.	Total.
Less than two months.....	14	7	21
Two to four months.....	6	4	10
Four to six months.....	5	5	10
Six to twelve months.....	5	7	12
More than one year.....	5	8	13
Total.....	35	31	66

TABLE VI.

*Showing number of admissions to this hospital in those admitted during the year.*

	Men.	Women.	Total.
Admitted the first time.....	134	105	239
“ second time.....	18	22	40
“ third time.....	2	4	6
“ fourth time.....	2	1	3
“ fifth time.....	1		1
“ sixth time.....		1	1
“ seventh time.....		1	1
“ ninth time.....	1		1
“ eleventh time.....		1	1
Total.....	158	135	293

TABLE VII.

*Showing number of attacks in those admitted during the year.*

	Men.	Women.	Total.
First.....	132	101	233
Second.....	17	21	38
Third.....	6	6	12
Fourth.....	1	3	4
Fifth.....		1	1
Sixth.....		1	1
Seventh.....	1	1	2
Ninth.....	1		1
Eleventh.....		1	1
Total.....	158	135	293

TABLE VIII.

*Showing duration of insanity in those admitted during the year.*

	Men.	Women.	Total.
Less than one month.....	45	37	82
One to three months.....	13	19	32
Three to six months.....	16	9	25
Six to nine months.....	8	9	17
Nine to twelve months.....	1	3	4
Twelve to eighteen months.....	5	14	19
Eighteen months to two years.....	1	0	1
Two to three years.....	13	5	18
Three to four years.....	5	1	6
Four to five years.....	0	3	3
Five to ten years.....	1	5	6
Ten to fifteen years.....	3	3	6
Fifteen to twenty years.....	3	4	7
Twenty to thirty years.....	0	4	4
Over thirty years.....	1	1	2
Not insane.....	3	3	6
Unknown.....	40	15	55
Total.....	158	135	293

TABLE IX.

*Showing ages of those admitted during the year.*

	Men.	Women.	Total.
Under fifteen .....	1	1	2
Fifteen to twenty .....	5	5	10
Twenty to twenty-five .....	7	9	16
Twenty-five to thirty .....	16	14	30
Thirty to thirty-five .....	14	10	24
Thirty-five to forty .....	14	13	27
Forty to forty-five .....	19	11	30
Forty-five to fifty .....	16	19	35
Fifty to sixty .....	30	28	58
Sixty to seventy .....	23	14	37
Seventy to eighty .....	9	9	18
Over eighty .....	4	2	6
Total .....	158	135	293

TABLE X.

*Showing form of disease in those admitted during the year.*

	Men.	Women.	Total.
Senile dementia .....	23	21	44
Manic depressive .....	9	35	44
Dementia praecox .....	18	14	32
Involuntional melancholia .....	9	23	32
Acute alcoholism .....	24	1	25
Paresis .....	20	3	23
Organic dementia .....	14	5	19
Paranoia .....	4	8	12
Imbecility .....	7	5	12
Secondary dementia .....	3	5	8
Epileptic " .....	4	1	5
Alcoholic " .....	5	0	5
Syphilitic " .....	0	1	1
Acute delirium .....	2	1	3
Toxic confusional insanity .....	3	4	7
Chronic alcoholism .....	3	1	4
Epileptic insanity .....	2	0	2
Traumatic " .....	1	0	1
Chorice " .....	0	1	1
Presenile " .....	0	1	1
Psychic epilepsy .....	1	0	1
Hypochondriasis .....	1	0	1
Hysteria .....	0	1	1
Psychasthenia .....	1	0	1
Morphomania .....	1	1	2
Not insane .....	3	3	6
Total .....	158	135	293



TABLE XI.

*Showing possible causes or predisposing factors in cases admitted during the year.*

	Men.	Per Cent.	Women.	Per Cent.	Total.	Per Cent.
Heredity.....	22	14	26	19	48	16
Alcohol.....	40	25	7	5	47	15.5
Old age.....	20	12	13	9.6	33	11
Previous attack.....	5	3	7	5	12	4
Overwork.....	6	3.5	8	5.8	14	4.5
Injury.....			8	5.8	8	3
Domestic unhappiness.....			7	5	7	2.5
Ill health.....	2	1.3	7	5	9	3
Menopause.....			12	9		
Operation.....	2	1.3	3	2.2	5	1.2
Grief or worry.....			6	4.4	6	2
Sunstroke.....	3	2			3	1
Childbirth.....			2	1.5		
Syphilis.....	2	1.3	1	.7	3	1
Drug habits.....	2	1.3	2	1.5	4	1.4
Prison life.....	2	1.3			2	.7
No possible cause obtained.....	52	33	44	33	96	33

TABLE XII.

*Showing civil condition of those admitted during the year.*

	Men.	Women.	Total.
Married.....	75	64	139
Single.....	61	42	103
Widowed.....	18	24	42
Divorced.....	2	2	4
Unknown.....	2	3	5
Total.....	158	135	293

TABLE XIII.

*Showing occupation of those admitted during the year.*

	Men.	Women.	Total.
Laborer.....	38	0	38
Farmer.....	20	0	20
Mill operative.....	7	12	19
Housewife.....	0	75	75
Domestic.....	0	14	14
Shoemaker.....	10	0	10
Merchant.....	3	0	3
Teamster.....	4	0	4
Painter.....	10	0	10
Machinist.....	8	0	8
Dressmaker.....	0	3	3
Nurse.....	0	1	1
Teacher.....	0	3	3
Physician.....	4	0	4
Stone mason.....	2	0	2
Quarryman.....	2	0	2
Lumberman.....	4	0	4
Bricklayer.....	3	0	3
Railroad conductor.....	1	0	1
Blacksmith.....	2	0	2
Carpenter.....	5	0	
Store clerk.....	5	1	6
Cook.....	2	1	
Stenographer.....	0	2	2
Bookkeeper.....	1	0	1
Cooper.....	1	0	1
Engineer.....	1	0	1
Tool sharpener.....	1	0	1
Glove maker.....	1	0	
Box ".....	0	1	1
Book ".....	1	0	1
Broom ".....	1	0	1
Printer.....	1	0	1
Woolen manufacturer.....	1	0	1
Scene painter.....	1	0	1
Gambler.....	1	0	
Hostler.....	1	0	
Chauffeur.....	1	0	
No occupation.....	15	22	37
Total.....	158	135	293

TABLE XIV.

*Showing nativity of those admitted during the year.*

	Men.	Women.	Total.
New Hampshire.....	79	67	146
Canada .....	23	25	48
Massachusetts.....	6	10	16
Ireland.....	9	7	16
Maine.....	6	8	14
Vermont.....	7	7	14
England.....	3	2	5
Sweden.....	1	3	4
Italy.....	3	0	3
New York.....	1	2	3
Michigan.....	2	0	2
Connecticut.....	1	1	2
Rhode Island.....	1	0	1
Pennsylvania.....	1	0	1
Indiana.....	1	0	1
Virginia.....	1	0	1
Scotland.....	1	0	1
Russia.....	0	1	1
Austria.....	1	0	1
France.....	1	0	1
Turkey.....	1	0	1
Unknown.....	9	2	11
Total.....	158	135	293

TABLE XV.

*Showing residence of those admitted during the year.*

	Men.	Women.	Total.
Belknap county.....	9	6	15
Carroll.....	5	3	8
Cheshire ".....	8	5	13
Coos ".....	6	1	7
Grafton ".....	14	17	31
Hillsborough county.....	36	41	77
Merrimack ".....	35	30	65
Rockingham ".....	23	10	33
Strafford.....	17	16	33
Sullivan.....	5	5	10
Pennsylvania.....		1	1
Total.....	158	135	293

TABLE XVI.

*Showing by what authority committed.*

	Men.	Women.	Total.
Friends.....	67	90	157
County commissioners.....	45	25	70
Town or city.....	37	17	54
Court.....	7	3	10
Governor or Council.....	2	0	2
Total.....	158	135	293

TABLE XVII.

*Showing by whom supported.*

	Men.	Women	Total.
Private.....	34	47	81
Private with aid.....	21	23	44
State .....	97	63	160
County .....	4	1	5
Town or city.....	2	1	3
Total.....	158	135	293

TABLE XVIII.

*Showing deaths during the year and their causes.*

	Men.	Women.	Total.
Paresis.....	12	4	16
Pulmonary tuberculosis.....	4	6	10
Organic heart disease.....	6	5	11
Valvular disease of the heart.....	4	2	6
Myocarditis .....	5	4	9
Acute dilatation of the heart.....	1	2	3
Lobar pneumonia.....	3	0	3
Hypo-tatic pneumonia.....	2	2	4
Broncho pneumonia.....	0	1	1
Acute parenchymatous nephritis .....	2	0	2
Chronic interstitial nephritis.....	4	1	5
Uraemia.....	1	0	1
Arteriosclerosis.....	3	2	5
Cerebral embolism.....	7	1	8
Pulmonary ".....	1	1	2
Enteritis .....	1	0	1
Tubercular enteritis.....	1	0	1
Dysentery.....	2	3	5
Enterocolitis.....	1	3	4
Diarrhoea and exhaustion.....	0	1	1
Epilepsy.....	1	0	1
Acute alcoholic epilepsy .....	1	0	1
Status epilepticus.....	2	0	2
Cholemia.....	0	1	1
Catarrhal jaundice.....	1	0	1
Carcinoma of uterus.....	0	1	1
Septicemia.....	0	2	2
Erysipelas.....	0	1	1
Acute delirium.....	1	0	1
Senile gangrene.....	1	0	1
Exhaustion in melancholia .....	1	3	4
"    "    mania.....	0	1	1
"    "    manic depressive insanity.....	0	1	1
"    "    acute confusional .....	0	1	1
"    "    senile dementia.....	5	3	8
"    "    organic .....	2	1	3
"    "    chronic .....	0	2	2
Heat exhaustion .....	0	1	1
Total.....	75	56	131

TABLE XIX.

*Showing ages at time of death.*

	Men.	Woman.	Total.
Between twenty and thirty years.....	2	4	6
“ thirty and forty years.....	11	10	21
“ forty and fifty years.....	11	8	19
“ fifty and sixty years.....	16	10	26
“ sixty and seventy years.....	18	9	27
“ seventy and eighty years.....	10	9	19
“ eighty and ninety years.....	5	6	11
Over ninety years.....	2	0	2
Total.....	75	56	131

TABLE XX.

*Showing ages of those remaining at end of the year.*

	Men.	Women.	Total.
Under twenty years of age.....	7	4	11
Twenty to thirty years of age.....	52	36	88
Thirty to forty years of age.....	110	86	196
Forty to fifty years of age.....	116	101	217
Fifty to sixty years of age.....	101	88	189
Sixty to seventy years of age.....	58	63	121
Seventy to eighty years of age.....	31	33	64
Over eighty years of age.....	1	7	8
Unknown.....	7	8	15
Total.....	483	426	909

TABLE XXI.

*Showing duration of diseases in those remaining at end of year.*

	Men.	Women.	Total.
Less than one month.....	4	2	6
From one to three months.....	12	11	23
“ three to six months.....	10	7	17
“ six to nine months.....	10	7	17
“ nine to twelve months.....	3	2	5
“ twelve to eighteen months.....	41	40	81
“ eighteen to twenty-four months.....	1	0	1
“ two to three years.....	46	46	92
“ three to four years.....	50	24	74
“ four to five years.....	15	11	26
“ five to ten years.....	106	100	206
“ ten to fifteen years.....	49	47	96
“ fifteen to twenty years.....	35	37	72
“ twenty to twenty-five years.....	18	24	42
“ twenty-five to thirty years.....	18	16	34
“ thirty to forty years.....	15	24	39
Over forty years.....	8	11	19
Unknown.....	41	17	58
Not insane.....	1	0	1
Total.....	483	426	909

TABLE XXII.

*Showing prospect of recovery in those admitted during the year.*

	Men.	Women	Total.
Curable (apparently).....	45	43	88
Incurable ".....	110	89	199
Not insane.....	3	3	6
Total.....	158	135	293

TABLE XXIII.

*Showing prospect of recovery in those remaining at end of year.*

	Men.	Women	Total.
Curable (apparently).....	17	27	44
Incurable ".....	465	339	864
Not insane.....	1	0	1
Total.....	483	426	909

TABLE XXIV.

*Showing contribution of inmates to this hospital during the year  
in relation to density of population.*

	Men.	Women.	Total.	Ratio to Population.
From cities over 10,000 representing a population of 134,000 .....	66	58	124	1-1100
From cities and towns between 10,000 and 5,000, representing a population of 64,000 .....	25	19	44	1-1450
From towns between 5,000 and 1,000 representing a population of 118,000 .....	33	30	65	1-1800
From towns of 1,000 or less represent- ing a population of 74,000. ....	29	25	54	1-1350
Unclassified.....	3	3	6	
Total.....	158	135	293	1-1400



TABLE XXV.

*Statistics of admissions, discharges, and deaths from the opening of the hospital.*

Year	Admitted.	Discharged and died.	Recovered.	Improved.	Unimproved.	Died.	Whole number under treatment.	Remaining at end of hospital year.	Daily averages of the hospital.		
									Men.	Women.	Total.
1843	76	29	12	10	6	1	76	47			
1844	104	81	37	20	19	5	151	70			
1845	88	82	37	17	22	6	158	76			
1846	98	76	26	23	16	11	174	98			
1847	89	87	38	17	23	9	187	100			
1848	92	83	29	20	26	8	192	109			
1849	81	76	36	15	11	14	190	114			
1850	103	90	45	18	20	7	217	127			
1851	88	98	45	25	16	12	215	117			
1852	107	106	66	13	16	11	224	118			
1853	132	107	65	25	11	8	250	143			
1854	141	123	63	24	22	14	281	161			
1855	95	91	50	20	9	12	246	155			
1856	85	96	66	13	7	10	250	154			
1857	97	81	47	15	7	12	251	170			
1858	76	77	34	20	5	18	246	169			
1859	98	85	31	22	18	14	267	182			
1860	85	83	38	16	12	17	267	184	94.0	88.0	182.0
1861	106	94	34	34	10	16	290	196	90.0	100.0	190.0
1862	86	94	42	32	7	13	282	188	88.7	105.7	194.4
1863	101	85	30	32	17	16	289	204	87.4	105.9	193.3
1864	105	92	36	16	17	23	309	217	99.4	107.4	206.8
1865	107	102	42	23	14	22	324	223	102.5	115.9	218.4
1866	104	91	26	28	16	21	327	236	106.3	122.6	228.9
1867	117	107	39	24	27	17	353	246	119.3	122.6	241.9
1868	118	129	51	39	18	21	364	235	118.5	121.27	239.77
1869	95	93	42	20	9	22	330	237	113.7	129.9	243.6
1870	130	114	37	34	20	23	367	253	123.1	125.9	249.0
1871	135	163	65	37	29	32	388	225	119.8	123.44	243.22
1872	152	123	55	31	16	21	377	254	109.36	125.19	234.55
1873	194	172	61	51	27	33	448	273	127.8	139.5	267.3
1874	140	137	42	44	27	22	416	281	140.4	127.5	267.9
1875	120	140	53	37	30	20	401	261	126.6	138.1	264.7
1876	140	122	35	34	27	26	401	279	121.4	139.1	260.5
1877	119	118	36	38	27	17	398	280	121.2	150.3	271.5
1878	114	128	35	36	30	17	394	276	128.9	143.8	272.7
1879	73	81	27	23	8	23	349	268	126.3	143.8	270.1
1880	111	94	28	27	22	17	379	285	127.4	147.6	275.0
1881	134	117	33	39	23	22	419	302	133.3	158.6	291.9
1882	104	121	38	26	27	30	406	285	131.0	159.1	290.1
1883	133	123	41	23	34	25	418	295	120.3	164.1	284.4
1884	141	127	18	41	44	24	436	309	124.3	169.5	293.8
1885	138	122	30	20	36	36	447	322	128.8	181.9	310.7
1886	138	143	43	30	34	34	460	317	139.82	182.37	322.19
1887	143	128	32	28	28	33	460	328	137.22	184.12	321.34
1888	137	125	33	26	35	28	465	339	150.49	183.59	334.08
1889	155	158	41	38	34	36	491	337	161.06	175.80	336.86
1890	276	223	79	28	63	53	602	364	166.52	184.57	351.09
1891	173	165	42	40	37	38	527	372	175.62	184.99	360.61
1892	169	181	51	39	40	42	531	359	181.40	182.38	363.78
1893	166	154	47	35	34	37	508	368	183.72	193.63	377.35
1894	187	152	52	33	27	35	542	402	190.14	193.35	383.49
1895	175	165	55	45	27	36	566	414	199.57	204.79	404.36
1896	181	171	42	44	34	40	586	422	201.31	210.65	411.96
1897	147	147	38	30	30	36	561	422	210.26	214.60	424.86

TABLE XXV.—Continued.

Year.	Admitted.	Discharged and died.	Recovered.	Improved.	Unimproved.	Died.	Whole number under treatment.	Remaining at end of hospital year.	Daily averages of the hospital.		
									Men.	Women.	Total.
1898	150	163	46	40	34	33	567	409	201.93	210.71	412.64
1899	179	161	48	26	34	39	577	427	202.38	220.88	423.26
1900	149	151	37	37	26	49	568	425	198.42	221.71	420.13
1901	202	193	52	56	31	49	617	434	203.12	222.53	425.65
1902	247	217	76	53	25	56	670	464	223.86	242.49	466.35
1903	240	215	52	41	60	50	702	490	232.21	242.75	475.16
1904	303	213	57	46	32	69	782	580	260.26	257.63	517.89
1905	290	227	61	46	26	77	852	643	321.60	294.09	615.69
1906	234	209	58	29	34	73	861	668	343.75	308.27	652.02
1907	278	238	63	52	18	91	970	708	361.68	327.49	689.17
1908	299	176	56	28	12	68	1010	831	390.17	326.74	716.91
1909	292	248	65	43	19	112	1114	875	465.17	399.16	864.33
1910	293	259	66	33	23	131	1168	909	467.08	421.15	888.23

# TREASURER'S REPORT

FOR THE YEAR ENDING AUGUST 31, 1909.

## CASH RECEIPTS.

From support of patients:

Private patients .....	\$47,354.74
Town patients .....	1,348.43
County patients .....	469.44
From E. P. Nute for U. S. criminal .....	5.14
From state treasurer for twenty-year indigent insane.....	5,379.37
From state treasurer for criminal insane .....	9,396.28
From state treasurer for patients committed to state support for remedial treatment, by order of the commissioners of lunacy...	119,502.17
From state treasurer for aid to indigent patients .....	6,000.00
From financial agent for aid to indigent patients .....	7,333.34
From financial agent for income of Conant fund for support of indigent patients .....	275.92

Total from support of patients..... \$197,064.83

From financial agent:

Income from Adams fund.....	\$147.00
For improvement of grounds....	500.00
For library .....	100.00

747.00

From sales .....	\$1,922.96	
From District Nursing Associa- tion .....	176.81	\$2,099.77
From note, Mechanics Bank.....	\$4,000.00	
From note, Mechanics Bank....	3,500.00	7,500.00
From refund, account of overpay- ment to W. H. Lord.....	\$39.66	
From refund, account of overpay- ment to Eco Magneto Clock Co.	1.00	40.66
From C. P. Bancroft, treasurer building com- mittee, for cash loaned said committee on appropriation account, 1909-10.....		1,422.59
		<u>\$208,874.85</u>
Cash balance at beginning of year.....		10,312.38
		<u>\$219,187.23</u>

## CASH PAYMENTS.

## Salaries, wages, and labor:

Services .....	\$61,487.85	
Repairs .....	2,601.80	
Improvements .....	823.22	
Farm .....	4,502.60	\$69,415.47

## Food:

Butter .....	\$9,439.64
Beans .....	1,284.21
Cheese .....	284.89
Eggs .....	2,764.39
Flour .....	6,967.05
Fish .....	2,193.84
Fruit (dried and fresh).....	1,584.32
Meat .....	10,283.08
Molasses .....	508.19
Potatoes .....	2,158.14
Sugar .....	2,955.07

Tea .....	\$687.52	
Coffee .....	743.72	
Vegetables .....	55.87	
Groceries .....	8,308.07	
	<hr/>	\$50,218.00
Clothing and clothing materials:		
Boots, shoes, and rubbers.....	\$820.50	
Clothing .....	4,626.49	
	<hr/>	5,446.99
Heat, light, and power:		
Fuel .....	\$21,419.44	
Electricity .....	5,478.30	
Power .....	68.50	
	<hr/>	26,966.24
Miscellaneous:		
Provender .....	\$5,857.46	
Farm .....	3,499.54	
House furnishings .....	8,636.85	
Articles furnished and charged...	2,166.94	
Chapel services and entertain- ments .....	915.26	
Freight, express, telephone, and postage .....	1,445.24	
Medical and surgical.....	1,827.63	
Stationery and printing.....	943.30	
Laundry supplies .....	927.06	
Soap .....	938.92	
Tobacco .....	626.35	
Water .....	3,248.85	
Repairs .....	14,074.65	
Improvements .....	1,862.34	
Burial of state patients .....	74.00	
Workshop .....	370.31	
For returning patients.....	100.00	
Loaned appropriation account, 1909-10 .....	1,422.59	
Refund on account of overpayments	30.11	

Trustees' traveling expenses.....	\$129.63	
General expenses .....	111.80	
	<hr/>	\$19,208.83
Total .....		\$201,255.53
Cash paid for loans (notes).....		7,695.62
		<hr/>
		\$208,951.15
Balance of income carried to new account.....	10,236.08	
		<hr/>
		\$219,187.23

CONCORD, N. H., November 18, 1909.

I hereby certify that I have examined the vouchers representing payments made by Charles P. Bancroft, treasurer of the New Hampshire State Hospital, for the year ending August 31, 1909. I find the same correctly entered on the cash book, and a balance in the hands of the treasurer of ten thousand two hundred and thirty-six dollars and eight cents (\$10,236.08).

WM. PARKER STRAW,

*Auditor of Trustees.*



## TREASURER'S REPORT

---

FOR THE YEAR ENDING AUGUST 31, 1910.

I respectfully submit the following report of the finances of the institution for the year ending August 31, 1910, to the trustees:

### RECEIPTS.

Balance on hand September 1, 1909.....	\$10,236.08
Cash received from state treasurer for maintenance .....	164,522.82
from state treasurer for special appropriation for cemetery lot	300.00
for board of private patients....	44,273.51
for board of town patients.....	969.79
for board of county patients....	704.23
from financial agent as income from the John Conant fund..	294.50
from financial agent as income from the Isaac Adams' fund..	147.00
from financial agent for aid to indigent insane.....	8,000.00
from financial agent for fire protection .....	295.72
from financial agent for improvement of grounds.....	500.00
from financial agent for return of escaped criminals (special appropriation) .....	200.00
for articles sold.....	3,939.20
for articles sold other institutions: Butter .....	\$18.43

## Cash received for:

Cereals .....	\$11.92	
Cheese .....	105.67	
Flour .....	791.60	
Fruit .....	18.20	
Kitchen furnish- ings .....	14.50	
Live stock .....	24.00	
Molasses .....	20.20	
Sugar .....	1,434.65	
Soap .....	118.31	
Sundries .....	51.96	
	<hr/>	\$2,609.44
from temporary loans on appro- priation account .....		6,647.38
from all other sources.....		204.78
		<hr/>
		\$243,844.45

## EXPENDITURES.

## SALARIES, WAGES, AND LABOR.

Medical services .....	\$7,933.23
Ward services .....	26,774.70
General administration .....	29,058.86
Repairs and improvements.....	5,120.53
Farm, stable, and grounds.....	5,667.78
	<hr/>
	\$74,555.10

## FOOD.

Butter .....	\$7,765.11
Butterine .....	2,009.40
Beans .....	1,033.60
Bread and crackers.....	927.12
Coffee .....	789.08
Cocoa .....	198.80
Cereals, rice, meal, etc.....	1,348.08
Cheese .....	837.65
Eggs .....	2,362.72
Flour .....	8,626.95

Fish .....	\$2,670.85
Fruit (dried and fresh).....	1,974.67
Lard .....	168.15
Meat .....	9,951.15
Molasses and syrup .....	492.93
Potatoes .....	1,649.82
Sugar .....	8,596.39
Tea .....	752.79
Vegetables .....	45.63
Groceries (sundries) .....	3,929.89
	<hr/>
	\$56,130.78

## CLOTHING AND CLOTHING MATERIAL.

Boots, shoes, and rubbers.....	\$1,281.48
Clothing .....	3,841.02
Dry goods for clothing and small wares.....	4,314.84
Hats and caps .....	91.43
Sundries .....	105.59
	<hr/>
	\$9,634.36

## FURNISHINGS.

Beds, bedding, table linen, etc.....	\$1,753.54
Brushes, brooms, etc.....	534.98
Carpets, rugs, etc. ....	133.15
Crockery, glassware, cutlery, etc.....	1,025.13
Furniture and upholstery.....	894.55
Kitchen furnishings .....	648.92
Wooden ware, buckets, pails, etc.....	40.85
Sundries .....	1,074.01
	<hr/>
	\$6,105.13

## HEAT, LIGHT, AND POWER.

Coal .....	\$27,167.19
Electricity .....	4,774.73
Gas .....	429.83

Oil .....	\$229.95
Power .....	61.00
Sundries .....	36.00
	<hr/>
	\$32,698.70

## REPAIRS AND RENEWALS.

Brick .....	\$206.20
Cement, lime, and plaster.....	507.21
Doors, sashes, etc.....	101.46
Electrical work and supplies.....	498.02
Hardware, iron, steel, etc.....	1,429.46
Lumber .....	2,706.48
Machinery, etc. ....	200.68
Paints, oil, glass, etc.....	2,115.72
Plumbing, steam fitting, and supplies.....	2,223.32
Roofing and materials.....	16.74
Sundries .....	450.71
Mechanics and laborers not on payroll.....	5,368.94
Mechanics and laborers employed on power house .....	48.88
	<hr/>
	\$15,873.82

## FARM, STABLE, AND GROUNDS.

Blacksmith and supplies.....	\$458.56
Carriages, wagons, etc., and repairs.....	277.60
Fertilizers, vines, seeds, etc.....	979.79
Hay, grain, etc.....	6,854.16
Harnesses and repairs.....	298.51
Horses .....	1,339.00
Other live stock.....	285.79
Tools, farm machines, etc.....	445.61
Veterinary services and medicines.....	177.45
Labor not on payroll .....	324.66
Sundries .....	563.48
	<hr/>
	\$12,004.52

## MISCELLANEOUS.

Articles furnished and charged.....	\$1,632.09
Books, periodicals, etc.....	202.18
Chapel services and entertainments.....	806.50
Freight, expressage, and transportation.....	2,190.33
Funeral expenses .....	336.00
Laundry soap .....	1,038.58
Laundry supplies .....	368.31
Medical attendance, etc. (extra) .....	88.00
Medicines and hospital supplies .....	2,314.03
Postage .....	499.75
Printing and printing supplies.....	148.50
Return of runaways.....	211.06
Rental of coal shed.....	500.04
Stationery and office supplies.....	1,133.05
Training school instruction (extra).....	72.16
Travel and expenses (officials).....	350.45
Telephone and telegraph .....	315.35
Tobacco .....	552.01
Toilet soap .....	601.60
Water .....	3,390.15
Sundries .....	137.44
	<hr/>
	\$16,887.58

## SPECIAL APPROPRIATIONS.

Cemetery lot .....	\$300.00
Fire protection .....	295.72
Provisions for the criminal insane (paid from maintenance appropriation by authority of the governor and council) .....	2,451.88
	<hr/>
	\$3,047.60
Cash paid for temporary loans on appropriation account .....	6,647.38
	<hr/>
	\$9,694.98

Total expenditures .....	\$233,584.97
Balance of income carried to new account.....	10,259.48
	<hr/>
	\$243,844.45

CONCORD, N. H., November 14, 1910.

I hereby certify that I have examined the vouchers representing payments made by Charles P. Bancroft, treasurer of the New Hampshire State Hospital, for the year ending August 31, 1910. I find the same correctly entered on the cash book, and a balance in the hands of the treasurer of ten thousand two hundred and fifty-nine dollars and forty-eight cents (\$10,259.48).

WM. PARKER STRAW,

*Auditor of Trustees.*

#### OFFICERS' SALARIES.

Superintendent .....	\$3,000.00
Treasurer .....	500.00
Assistant superintendent .....	1,500.00
First assistant physician .....	1,500.00
Assistant physician .....	600.00
Assistant physician .....	600.00
Engineer .....	1,500.00
Steward .....	1,200.00



# FINANCIAL REPORT OF BUILDING COMMITTEE.

---

## LEGISLATIVE APPROPRIATION OF 1907-08.

### RECEIPTS.

1907.		
May	23.	Received from Solon A. Carter, state treasurer ..... \$634.44
June	28.	Received from Solon A. Carter, state treasurer ..... 2,518.20
July	19.	Received from Solon A. Carter, state treasurer ..... 4,170.40
Aug.	10.	Received from Solon A. Carter, state treasurer ..... 12,659.71
Oct.	3.	Received from Solon A. Carter, state treasurer ..... 23,755.81
Nov.	7.	Received from Solon A. Carter, state treasurer ..... 18,410.92
Dec.	6.	Received from Solon A. Carter, state treasurer ..... 14,785.08
Dec.	28.	Received from Solon A. Carter, state treasurer ..... 8,862.15
1908.		
Jan.	8.	Received from Solon A. Carter, state treasurer ..... 2,207.85
Feb.	29.	Received from Solon A. Carter, state treasurer ..... 5,338.91
April	4.	Received from Solon A. Carter, state treasurer ..... 5,258.25
May	7.	Received from Solon A. Carter, state treasurer ..... 3,296.13

June	19.	Received from Solon A. Carter, state treasurer .....	\$2,959.17
July	31.	Received from Solon A. Carter, state treasurer .....	5,143.70
Aug.	31.	Received from Solon A. Carter, state treasurer .....	6,495.00
Dec.	7.	Received from Solon A. Carter, state treasurer .....	1,320.37
1909.			
Jan.	2.	Received from Solon A. Carter, state treasurer .....	1,085.27
Jan.	8.	Received from Solon A. Carter, state treasurer .....	5,300.32
Jan.	22.	Received from Solon A. Carter, state treasurer .....	27,157.58
Feb.	11.	Received from Solon A. Carter, state treasurer .....	3,846.46
Mar.	12.	Received from Solon A. Carter, state treasurer .....	391.02
Mar.	27.	Received from Solon A. Carter, state treasurer .....	28.85
May	3.	Received from Solon A. Carter, state treasurer .....	1,079.40
1910.			
June	4.	Received from Solon A. Carter, state treasurer, balance due on 1907-08 appropriation .....	1,274.25
		Received from Wm. F. Thayer, financial agent, by special vote of trustees .....	382.55
			<hr/>
			\$158,361.79

## EXPENDITURES.

Cash paid Chadwick Boston Lead Co., for water main .....	\$59.19
Ludlow Valve Mfg. Co., valves for water main .....	36.57

Cash paid Concord "Evening Monitor," advertising .....	\$12.00
Builders' Iron Foundry, fitting for water main .....	28.50
Donaldson Iron Co., 10-inch water main .....	498.18
C. R. Whitcher, architect's fees....	2,091.05
John B. Clarke Co., advertising....	30.75
People and Patriot Co., advertising..	10.00
Union Publishing Co., advertising..	15.00
Telegraph Publishing Co., advertising .....	5.69
Ludlow Valve Mfg. Co., water main .....	72.03
City of Concord, water main supervision .....	37.70
water main payroll .....	255.98
C. L. Fellows & Co., architects' certificate No. 1.....	4,170.40
C. L. Fellows & Co., architects' certificate No. 2 .....	10,545.60
C. L. Fellows & Co., Kent pump pit, Peaslee foundation .....	450.00
C. R. Whitcher, commission on Fellows' certificates Nos. 1 and 2....	367.92
advertising .....	6.00
"Monitor and Statesman," advertising .....	3.13
Telegraph Publishing Co., advertising .....	2.50
H. W. Johns-Manville Co., pipe covering .....	52.13
F. W. Webb Mfg. Co., sewer pipe..	211.66
First National Bank, note account of architect to August 8, 1907...	1,019.77
C. L. Fellows & Co., architects' certificate No. 3.....	22,727.00
F. W. Webb Mfg. Co., soil pipe for sewer .....	91.25

Cash paid John B. Clarke Co., advertising for plumbing and heating.....	\$6.92
Union Publishing Co., advertising for plumbing and heating.....	3.35
C. R. Whiteher, commission on C. L. Fellows' certificate No. 3.....	568.17
C. R. Whiteher, commission on heating and plumbing contract.....	359.12
C. L. Fellows & Co., architects' certificate No. 4, on Kent and Peaslee building contract.....	15,668.00
Simpson Brothers' Corporation, laundry, granolithic floor.....	652.00
Albert S. Trask, architect's certificate No. 1, heating, plumbing, and ventilation contract.....	1,657.78
C. R. Whiteher, architect's commission on certificate No. 1, on A. S. Trask's contract .....	41.44
C. R. Whiteher, architect's commission, fourth payment of C. L. Fellows' contract .....	391.70
C. L. Fellows & Co., architect's certificate No. 5, Kent and Peaslee building contract .....	13,632.00
C. R. Whiteher, architect's commission on fifth payment, C. L. Fellows & Co .....	340.80
Albert S. Trask, architect's certificate No. 2, heating, plumbing, and ventilation contract .....	792.48
C. R. Whiteher, architect's commission on certificate No. 2, A. S. Trask's contract .....	19.80
C. L. Fellows & Co., architects' certificate No. 6, Kent and Peaslee building contract .....	8,646.00

Cash paid C. R. Whiteher, architect's commission on sixth payment to C. L. Fellows & Co. ....	\$216.15
Albert S. Trask, architect's certificate No. 3, heating, plumbing, and ventilation contract .....	2,154.00
C. R. Whiteher, architect's commission on third payment to Albert S. Trask, on heating and plumbing contract .....	53.85
C. L. Fellows & Co., architect's certificate No. 7, Kent, Peaslee, and laundry buildings contract.....	4,944.00
C. R. Whiteher, $2\frac{1}{2}\%$ commission on seventh payment, C. L. Fellows & Co. ....	123.60
Albert S. Trask, architect's certificate No. 4, on plumbing and ventilation contract .....	264.69
C. P. Whiteher, $2\frac{1}{2}\%$ commission on fourth payment of Albert S. Trask .....	6.62
A. S. Trask, architect's certificate No. 5, on heating, plumbing, and ventilation contract .....	712.00
C. R. Whiteher, architect's commission on fifth payment to A. S. Trask .....	17.80
C. L. Fellows & Co., architect's certificate No. 8, on Kent and Peaslee building contract .....	4,418.00
C. R. Whiteher, architect's commission on eighth payment to C. L. Fellows & Co.....	110.45
C. R. Whiteher, architect's commission on sixth payment to A. S. Trask .....	30.41

Cash paid Albert S. Trask, architect's certificate No. 6, on heating, plumbing, and ventilation contract.....	\$1,216.40
C. L. Fellows & Co., architect's certificate No. 9, on Kent and Peaslee building contract.....	1,853.00
C. R. Whiteher, architect's commission on ninth payment to C. L. Fellows & Co.....	46.32
C. L. Fellows & Co., one half insurance on Kent & Peaslee additions	150.00
C. L. Fellows & Co., architect's certificate No. 10, on Kent and Peaslee building contract.....	1,860.00
C. R. Whiteher, architect's commission on tenth payment to C. L. Fellows & Co., and seventh payment to A. S. Trask.....	72.17
Albert S. Trask, architect's certificate No. 7, on heating and plumbing contract .....	1,027.00
C. L. Fellows & Co., architect's certificate No. 11, on Kent and Peaslee building contract.....	2,240.00
Albert S. Trask, architect's certificate No. 8, on heating and plumbing contract .....	2,788.00
C. R. Whiteher, architect's commission on eleventh payment to C. L. Fellows and eighth payment to A. S. Trask .....	115.70
C. L. Fellows & Co., architect's certificate No. 12, on Kent and Peaslee building contract.....	6,495.00
Alexander Sloan, Jr., & Co., blankets	262.50
N. H. State Hospital, 800 yards A. C. A. ticking.....	82.50



Cash paid G. L. Lincoln Co., hair for mattresses	\$700.50
C. R. Whitcher, architect's commission on twelfth payment to C. L. Fellows & Co.....	162.37
Couch & Seeley Co., telephone system, Kent and Peaslee additions..	565.27
Eco Magneto Clock Co., watch clock system, Kent and Peaslee additions .....	520.00
John B. Varick Co., hardware contract on Kent and Peaslee additions .....	2,105.22
Concord Electric Co., electric fixture contract for Kent and Peaslee additions .....	379.05
Charles A. Hoitt Co., furniture contract, Kent and Peaslee additions	2,816.05
C. L. Fellows & Co., thirteenth and final payment on Kent, Peaslee, and laundry additions.....	26,382.05
C. R. Whitcher, architect's commission on thirteenth payment to C. L. Fellows .....	775.53
N. H. State Hospital, 50 bed pads at \$2.25 .....	112.50
Albert S. Trask, architect's certificate No. 9, final payment on heating, plumbing, and ventilation contract .....	3,752.65
C. R. Whitcher, architect's commission on ninth payment to A. S. Trask .....	93.81
Globe Rubber Works, unlined linen hose .....	225.00
Charles H. Austin, additional electric work in Kent and Peaslee additions .....	166.02

Cash paid Concord Electric Co., additional electric fixtures in Kent and Peaslee annex basements .....	\$28.85
Albert S. Trask, extra radiation in Kent annex .....	1,028.00
C. R. Whiteher, commission on Trask's bill for extra radiation in Kent annex .....	51.40
Martin & Howe, attorneys' account, settlement of the Trask contract..	1,500.00
B. W. Couch, account services in connection with the Trask account	157.80
	<hr/>
	\$158,361.79

C. P. BANCROFT,  
*Treasurer of Building Committee.*

# FINANCIAL REPORT OF THE BUILDING COMMITTEE.

## LEGISLATIVE APPROPRIATION OF 1909-10.

### RECEIPTS.

1909.		
July	10.	Received from Solon A. Carter, state treasurer ..... \$668.63
	13.	Received from Solon A. Carter, state treasurer ..... 572.97
Aug.	6.	Received from Solon A. Carter, state treasurer ..... 7,757.00
		Received from Solon A. Carter, state treasurer ..... 2,871.58
	26.	Received from Braman, Dow & Co., rebate freight ..... 48.26
Sept.	1.	Received from Solon A. Carter, state treasurer ..... 8,596.84
	10.	Received from Solon A. Carter, state treasurer ..... 454.13
	22.	Received from Solon A. Carter, state treasurer ..... 350.00
Oct.	4.	Received from Solon A. Carter, state treasurer ..... 1,213.97
	15.	Received from Solon A. Carter, state treasurer ..... 9,335.41
	28.	Received from Solon A. Carter, state treasurer ..... 145.74
Nov.	2.	Received from Solon A. Carter, state treasurer ..... 898.58

Nov.	11.	Received from Solon A. Carter, state treasurer .....	\$617.05
Dec.	2.	Received from Solon A. Carter, state treasurer .....	3,180.75
	11.	Received from Solon A. Carter, state treasurer .....	2,570.00
	29.	Received from Solon A. Carter, state treasurer .....	6,110.47
1910.			
Jan.	7.	Received from Solon A. Carter, state treasurer .....	2,471.53
Mar.	4.	Received from Solon A. Carter, state treasurer .....	5,026.66
April	2.	Received from Solon A. Carter, state treasurer .....	311.90
	30.	Received from Solon A. Carter, state treasurer .....	397.86
May	19.	Received from Solon A. Carter, state treasurer .....	602.99
June	4.	Received from Solon A. Carter, state treasurer .....	1,208.39
		Received from Solon A. Carter, state treasurer, for cash advanced to meet payments on account of payroll for steam fitters, etc....	1,633.32
	17.	Received from Solon A. Carter, state treasurer .....	467.26
July	1.	Received from Solon A. Carter, state treasurer .....	1,505.52
	22.	Received from Solon A. Carter, state treasurer .....	2,096.64
Aug.	6.	Received from Solon A. Carter, state treasurer .....	2,623.23
	31.	Received from Solon A. Carter, state treasurer .....	525.25
Sept.	14.	Received from Solon A. Carter, state treasurer .....	2,000.00

Oct.	22.	Received from Solon A. Carter, state treasurer .....	\$1,491.06
Nov.	4.	Received from Solon A. Carter, state treasurer .....	1,800.51
	11.	Received from Geo. A. Weld Co., rebate on freight .....	12.04
			<hr/>
			\$69,565.54

## EXPENDITURES.

(1909-10.)

## Cash paid:

June	9.	Concord water-works, payroll, May 31-June 9 .....	\$294.47
	10.	Concord water-works, iron pipe and fittings .....	141.45
	12.	Payroll, June 1-12, steamfitters... Kendall, Taylor & Co., architects' fee .....	117.16
		N. H. State Hospital, advertising for proposals .....	100.00
		Union Pub. Co., advertising for proposals .....	8.55
			7.00
July	13.	F. W. Webb Mfg. Co., castiron pipe and fittings .....	313.33
		Kendall, Taylor & Co., architects' fee .....	50.00
		George L. Theobald, teaming.....	9.00
		Payroll, June 14-30 .....	200.64
Aug.	6.	Engineer's certificate No. 1, boiler house contract .....	7,757.00
		Ludlow Valve Mfg. Co., valves and hydrants for barn fire main....	96.12
		Braman, Dow & Co., steam pipe and fittings for boiler house.....	875.90
		Lynchburg Foundry Co., water main for barn .....	444.67
		Payroll, July 1-31.....	98.06

Aug.	6.	B. & M., freight on pipe.....	\$95.77
		Crane & Co., valves and fittings for boiler house .....	512.06
		Braman, Dow & Co., steam pipe and fittings for boiler house.....	749.00
Sept.	1.	C. L. Fellows & Co., certificate No. 2, boiler house contract.....	8,045.00
		Braman, Dow & Co., pipe and valves .....	455.31
		Jenkins Bros., packing.....	13.23
		Concord Light & Power Co., pipe and fittings .....	9.80
		Payroll, August 1-14 .....	73.50
	11.	Paid for steamfitters' labor in boiler house, August 15-31 .....	79.13
		Paid George L. Theobald for mov- ing boilers from station to boiler house .....	375.00
	22.	Paid Fred F. Stockwell, assignee, for five sets Lamprey arch pro- tectors .....	350.00
Oct.	4.	Paid for labor, diggers, September 13-21 .....	35.89
		Paid Braman, Dow & Co., Boston, for five pairs of heavy pipe tongs	44.34
		Paid Braman, Dow & Co., pipe and fittings for boiler house.....	218.01
		Paid Perfection Grate Co., Spring- field, Mass., for five Perfection grates .....	788.29
		Paid Crane Co., for heavy flange tee	31.94
		Paid for labor, steamfitter, and helper .....	95.50
Oct.	15.	Paid Braman, Dow & Co., for valve and flanges .....	57.23
		Paid Knowlton Packing Co., New- tonville, Mass., for sheet packing	25.04



Oct.	15.	Paid Sidney Smith, first payment on contract for boiler setting....	\$1,500.00
		Paid C. L. Fellows & Co., first payment on coal pocket contract	2,640.00
		Paid C. L. Fellows & Co., third payment on boiler house contract..	5,000.00
		Paid American Steam Gage & Valve Mfg. Co., Boston, Mass., for five safety valves.....	113.14
	29.	Paid for steamfitter and helper....	31.50
		Paid American Steam Gage & Valve Mfg. Co., for balance due on five safety valves .....	60.76
		Paid Concord Pipe Co., Concord, for soil pipe and fittings for boiler house .....	48.35
		Paid Orr & Rolfe, Concord, one soil pipe fitting .....	.35
		Paid Wm. H. Gallison Co., Boston, for nuts and bolts for boiler house piping .....	4.78
Nov.	2.	Paid Hodge Boiler Works, East Boston, for two receiving and one blow-off tanks .....	226.00
		Paid Braman, Dow & Co., W. I. pipe and fittings for boiler house	247.53
		Paid Braman, Dow & Co., for one 700 H. P. Wainwright hot water heater .....	420.00
	9.	Paid Braman, Dow & Co., for brass pipe and fittings and one chain hoist .....	283.80
		Paid Knowlton Packing Co., Newtonville, for packing.....	59.86
	11.	Paid steamfitters' labor in boiler house .....	161.44
		Paid Braman, Dow & Co., for exhaust head, pipe, and fittings....	161.42

Nov.	11.	Paid Wm. H. Gallison Co., Boston, extra heavy pipe fittings for boiler house .....	\$3.84
Dec.	2.	Paid C. L. Fellows & Co., second payment on coal pocket contract	3,000.00
		Paid Hodge Boiler Works, East Boston, for one receiving tank for boiler house .....	146.00
		Paid Concord Pipe Co., for plumb- ing stock for Peaslee building..	31.75
	11.	Paid C. L. Fellows & Co., third payment on boiler house contract	2,050.00
		Paid C. L. Fellows & Co., first pay- ment on Peaslee building toilet room contract .....	400.00
	11.	Paid Dalton-Ingersoll Mfg. Co., Boston, plumbing fixtures for Peaslee building toilet room....	120.00
	29.	Paid C. L. Fellows & Co., for third payment on coal pocket contract	736.00
		Paid Dalton-Ingersoll Mfg. Co., Boston, for slop sinks and fittings for Peaslee toilet rooms .....	70.50
		Paid Kendall, Taylor & Co., Boston, for architects' commission for plans for coal pocket.....	520.94
		Paid Walter L. Jenks & Co., Con- cord, for boiler house hardware..	52.52
		Paid C. L. Fellows & Co., for fourth payment on boiler house contract	3,985.49
		Paid C. L. Fellows & Co., for extra mason work required in boiler settings and concrete floors.....	745.51
1910.			
Jan.	15.	Paid Sidney Smith, second payment on boiler setting contract.....	533.32

Jan.	15.	Paid Braman, Dow & Co., for heavy flanged tees for boiler house piping .....	\$77.04
Feb.	10.	Paid C. L. Fellows & Co., fourth payment on coal pocket contract .....	1,494.00
Mar.	4.	Paid Hodge Boiler Works, East Boston, first payment on boiler contract .....	5,000.00
		Paid Braman, Dow & Co., Boston, for tinned copper for Peaslee plumbing .....	16.31
		Paid Dalton-Ingersoll Mfg. Co., Boston, for bolts for Peaslee plumbing .....	6.60
		Paid Monitor & Statesman Co., for advertising for proposals.....	3.75
April	4.	Paid C. L. Fellows & Co., for balance due on Peaslee toilet rooms .....	201.50
		Paid Sidney Smith for extra work on boiler settings .....	33.60
		Paid C. L. Fellows & Co., fifth payment on boiler and coal house contracts .....	76.80
May	6.	Paid Richard D. Kimball Co., Boston, architects' commission on electric light, heat, and power plant .....	247.86
		Paid the Fairbanks Co., Boston, for rails and spikes for track in coal pocket and boiler house.....	150.00
	19.	Paid Dalton-Ingersoll Mfg. Co., Boston, bathtubs and fittings for Peaslee toilet rooms.....	186.90
		Paid Braman, Dow & Co., for pipe and fittings for boiler house....	327.38
		Paid C. L. Fellows & Co., final payment on coal pocket contract...	23.20

May	19.	Paid C. L. Fellows & Co., final payment on boiler house contract..	\$65.51
	26.	Paid Braman, Dow & Co., pipe and fittings for boiler house.....	100.91
		Paid Braman, Dow & Co., pipe and fittings for boiler house.....	711.38
June	8.	Paid the Fairbanks Co., one coal car for boiler house.....	76.00
		Paid the Fairbanks Co., one set of scales for boiler house.....	96.00
		Paid Dalton-Ingersoll Mfg. Co., plumbing for boiler house.....	21.35
		Paid Braman, Dow & Co., steamfitters' labor, connecting boilers with heating system.....	52.00
		Paid steamfitters and helpers' labor for month of May in connecting up boiler house with heating system .....	150.75
	17.	Paid Braman, Dow & Co., pipe and fittings for boiler house.....	62.88
		Paid Richard D. Kimball Co., architects' commission for plans and specifications for heat, light, and power plant, second payment on account .....	200.00
		Paid Braman, Dow & Co., for steam pipe and fittings for boiler house .....	140.98
		Paid Braman, Dow & Co., for steamfitters' labor, connecting boiler house with heating system	57.20
		Paid Braman, Dow & Co., for one swing check valve .....	6.20
	20.	Paid Braman, Dow & Co., for pipe and fittings for boiler house....	65.05

July	2.	Paid Simpson Bros., corporation, Boston, for laying reënforced concrete floor on second story of boiler house .....	\$398.97
		Paid Braman, Dow & Co., for ex- tractors and separators for boiler house .....	578.59
		Paid Braman, Dow & Co., steam pipe and fittings for connecting boiler house with heating system	470.76
		Paid Braman, Dow & Co., steam- fitters' labor in connecting boiler house with heating system.....	57.20
	22.	Paid Braman, Dow & Co., steam pipe and fittings for boiler house	605.76
		Paid Braman, Dow & Co., steam pipe and fittings for boiler house	93.43
		Paid steamfitters and helpers for month of June, connecting up boiler house with heating system	265.25
		Paid Braman, Dow & Co., steam- fitters and helpers for month of June, connecting up boiler house with heating system .....	62.40
		Paid the Fairbanks Co., for rails and switches for track leading from coal pocket to boiler room..	177.08
		Paid Braman, Dow & Co., steam pipe fittings for connecting boiler house with heating system.....	74.34
		Paid Braman, Dow & Co., steam pipe fittings for connecting boiler house with heating system.....	237.19
		Paid Braman, Dow & Co., steam pipe fittings for connecting boiler house with heating system.....	189.73

July	22.	Paid Braman, Dow & Co., steam pipe fittings for connecting boiler house with heating system.....	\$251.41
		Paid Hutchinson Bldg. Co., Concord, Monitor sash adjusters for boiler house .....	75.00
Aug.	6.	Paid Braman, Dow & Co., steam pipe and fittings used in connecting boiler house with heating system .....	206.50
		Paid Braman, Dow & Co., steam pipe and fittings used in connecting boiler house with heating system .....	5.47
		Paid Braman, Dow & Co., plumbing fixtures for boiler house.....	12.00
		Paid Braman, Dow & Co., for steam pipe, valves, and fittings used in connecting boiler house with heating system .....	1,237.26
		Paid Braman, Dow & Co., for steam pipe, valves, and fittings used in connecting boiler house with heating system .....	8.89
	10.	Paid Braman, Dow & Co., labor of steamfitter connecting up boiler house with present heating system .....	57.20
		Paid steamfitters and helpers for connecting up boiler house with present heating system for month of July .....	248.25
		Paid H. W. Johns-Manville Co., Boston, for covering smoke flue leading to chimney, inside and outside boiler house, as per contract .....	463.32



Aug. 10.	Paid Simpson Bros.' Corporation for laying granolithic floor in boiler room as per contract....	\$353.14
	Paid Braman, Dow & Co., for labor of steamfitter connecting up boilers with present heating system .....	31.20
25.	Paid Braman, Dow & Co., steam pipe and fittings for connecting boiler house with heating system .....	138.51
	Paid Braman, Dow & Co., steam pipe and fittings for connecting boiler house with heating system .....	22.93
	Paid Fairbanks Co., three coal cars .....	166.19
	Paid Sidney Smith, third and final payment on boiler settings.....	266.68
	Paid Hodge Boiler Works, East Boston, second and final payment on boilers .....	367.00
	Paid Braman, Dow & Co., valve used in connecting boilers with present heating system .....	61.25
	Paid Braman, Dow & Co., steam pipe and fittings used in connecting boilers with heating system..	114.65
	Paid Braman, Dow & Co., labor of steamfitters connecting up boilers with present heating system .....	116.13
	Paid Braman, Dow & Co., steam-fittings for boiler house.....	2.58
	Paid Bowker, Torrey Co., Boston, for slate for toilet room, boiler house .....	60.15
	Paid Braman, Dow & Co., steam-fittings for boiler house.....	37.48
	Paid Braman, Dow & Co., steam-fittings for boiler house.....	34.33

Aug. 26.	Paid Braman, Dow & Co., for steamfitters connecting up new boilers with present heating system .....	\$62.40
	Paid Braman, Dow & Co., steam-fittings for boiler house.....	7.29
30.	Paid Braman, Dow & Co., steam pipe, fittings, and valves for connecting boilers with present heating system .....	151.79
	Paid Braman, Dow & Co., valves for connecting boilers with present heating system .....	14.83
	Paid Braman, Dow & Co., brass pipe, valves and unions for connecting boilers with present heating system .....	58.14
	Paid Braman, Dow & Co., steam-fitters, for connecting up boilers with present heating system....	31.20
31.	Paid steamfitters and helpers for work on connecting up boilers with heating system for month of August .....	286.34
	Paid Braman, Dow & Co., for steamfitters connecting up boilers with heating system .....	62.40
	Paid Braman, Dow & Co., steam pipe and fittings used in connecting boilers with heating system .....	103.03
	Paid Braman, Dow & Co., one 2½" Ross feed water filter with gauges for boilers .....	245.00
	Paid Braman, Dow & Co., steam-fitting for boiler room.....	5.79
	Paid Braman, Dow & Co., two Anderson steam traps for boiler house .....	31.59

Aug.	31.	Paid Braman, Dow & Co., galvanized W. I. pipe for boiler house..	\$77.57
Oct.	22.	Paid Braman, Dow & Co., plumbing supplies .....	3.73
		Paid Braman, Dow & Co., plumbing supplies .....	26.17
		Paid Braman, Dow & Co., labor..	62.40
		Paid George A. Weld Co., steam-fitting supplies .....	450.00
		Paid the Bristol Co., Bristol recording gauge .....	32.00
		Paid Braman, Dow & Co., labor....	49.70
		Paid Braman, Dow & Co., plumbing supplies .....	11.52
		Paid Boston Fire Proof Covering Co., steam pipe covering contract	419.81
		Paid payroll for September.....	80.75
		Paid Braman, Dow & Co., plumbing supplies .....	7.73
		Paid R. D. Kimball Co., third payment on electric plant contract..	195.67
		Paid Braman, Dow & Co., labor...	31.20
		Paid Braman, Dow & Co., plumbing supplies .....	14.78
		Paid Braman, Dow & Co., labor...	105.60
Nov.	4.	Paid Braman, Dow & Co., steam-fittings .....	172.13
		Paid Braman, Dow & Co., labor....	31.20
		Paid H. W. Johns-Manville Co., 80% of work and stock on pipe covering contract .....	1,122.20
		Paid Orr & Rolfe, heating and ventilating of engineer's and engine room in boiler house.....	313.64
		Paid payroll for October.....	58.50
		Paid Braman, Dow & Co.....	62.40
		Paid Braman, Dow & Co., steam-fittings .....	32.52

Nov.	4.	Paid Braman, Dow & Co., steam-	
		fittings .....	\$7.92
		Paid Braman, Dow & Co., labor....	31.20
		Paid Braman, Dow & Co., plumbing	
		supplies .....	97.64
			<hr/>
			\$67,682.34

## STATEMENT OF APPROPRIATION ACCOUNT OF 1909-10 TO NOVEMBER 15, 1910.

Amount of appropriation, 1909-10.....	\$85,000.00
Proceeds of bonds, less expense of printing....	2,925.50
	<u>\$87,925.50</u>
Total receipts to date:	
Received from state treasurer....	\$69,505.24
Received from rebates.....	60.30
	<u>69,565.54</u>
Balance due on appropriation .....	<u>\$18,359.96</u>
Total expended to date .....	\$67,682.34
Bank balance .....	\$2,099.94
Less balance from 1903-04 and	
1905-06 appropriations .....	216.74
	<u>1,883.20</u>
	<u>\$69,565.54</u>

### UNCOMPLETED CONTRACTS.

Ridgeway Dynamo Co., engines.....	\$4,803.00
Westinghouse Electric & Mfg. Co., generators..	3,459.00
H. W. Johns-Manville Co., balance on pipe cov- ering in engine room .....	512.80
Taunton-New Bedford Copper Co., switchboard	1,395.00
Cushman Electric Co., motors.....	1,171.80
Wetmore-Savage Co., copper wire and electrical materials .....	2,284.32
	<u>\$13,625.92</u>
Unexpended balance .....	4,734.04
	<u><u>\$18,359.96</u></u>

## GENERAL EXHIBIT.

---

### PRODUCTS OF THE FARM AND GARDEN, AT MARKET VALUE, FOR THE YEAR 1909.

736 bunches asparagus .....	\$0.12	88.32
7,000 pounds rhubarb .....	.01	70.00
9,000 heads lettuce .....	.04	60.00
1,427 dozen cucumbers .....	.15	214.05
98 bushels pickle cucumbers....	1.50	147.00
283 bushels turnips .....	.50	141.00
25 tons squash .....	20.00	500.00
67 bushels peas .....	1.60	107.20
343 bushels spinach .....	.40	137.00
117 bushels string beans.....	.80	93.60
180 bushels shell beans.....	1.25	225.00
131 bushels ripe tomatoes.....	1.00	131.00
825 bushels green tomatoes.....	.75	618.75
1,765 dozen corn .....	.12	211.80
1,000 heads early cabbage.....	.05	50.00
8,000 heads late cabbage.....	.08	640.00
625 bushels beets .....	.60	375.00
1,500 heads early celery.....	.06	90.00
3,500 heads late celery.....	.08	280.00
425 bushels onions .....	.80	336.00
278 bushels parsnips .....	.75	208.50
311 bushels summer squash.....	1.00	311.00
29 bushels peppers .....	.50	14.50
2,307 boxes strawberries .....	.12	253.77
50½ tons hay .....	18.00	909.00
26 tons oats .....	12.00	212.00
7 tons rowan .....	3.00	21.00



184,860 quarts milk .....	\$0.06	\$11,091.60
15,210 pounds of pork .....	.08	1,216.80
18 pigs .....	2.50	45.00
38 calves .....	1.50	57.00
2,200 pounds of beef for use.....	.08	176.00
1 boar .....		8.00
4 cows, old .....		55.00
6 hides sold .....		22.05
5,210 cakes of ice .....	.08	416.80
		<hr/>
		\$19,633.74

## PRODUCTS OF THE FARM AT SUNNYSIDE FOR THE YEAR 1909.

1,656 bushels potatoes .....	\$0.70	\$1,159.20
40 bushels carrots .....	.22	8.80
8 bushels parsnips .....	.50	4.00
28 bushels beets .....	.28	7.04
12 bushels spinach .....	.32	3.84
14 bushels cucumbers .....	1.00	14.00
25 bushels peas .....	1.25	31.25
16 bushels tomatoes .....	1.00	16.00
$\frac{3}{4}$ ton squash .....		8.00
12 bushels string beans.....	.80	9.60
12 bushels shell beans.....	1.00	12.00
1,200 heads lettuce .....	.03	36.00
100 dozen corn .....	.12	12.00
100 pounds rhubarb .....	.01	1.00
44 bunches radishes .....	.05	2.20
5 bushels turnips .....	.50	2.50
1,150 heads cabbage.....	.08	92.30
22 tons hay .....	18.00	306.00
2 tons oats .....	11.00	22.00
4 tons corn .....	6.00	24.00
3,308 quarts raspberries .....	.15	496.20
1,196 pounds pork .....	.08	95.68
596 quarts strawberries .....	.11	65.36
306 quarts blackberries .....	.12	36.72
256 quarts currants .....	.12	12.72

3,090	quarts milk .....	\$0.05	\$154.50
1,100	cakes ice .....	.04	44.00
2,352	dozen eggs .....	.35	823.20
97	barrels apples .....	3.00	291.00
			<hr/>
			\$3,791.11

## GENERAL EXHIBIT.

---

### PRODUCTS OF THE FARM AND GARDEN, AT MARKET VALUE, FOR THE YEAR 1910.

694 bunches asparagus .....	\$0.15	\$104.10
7,330 pounds rhubarb .....	.01	73.30
9,475 heads lettuce .....	.03	284.25
1,900 dozen cucumbers .....	.20	380.00
175 bushels pickle cucumbers....	1.50	262.50
448 bushels turnips .....	.85	380.80
35 tons squash .....	28.00	980.00
94 bushels peas .....	1.00	94.00
247 bushels spinach .....	.40	98.80
136 bushels string beans.....	.80	108.80
217 bushels shell beans .....	1.25	271.25
149 bushels ripe tomatoes .....	1.25	186.25
165 bushels green tomatoes .....	.85	140.25
3,200 dozen corn .....	.14	448.00
900 heads early cabbage .....	.05	45.00
8,500 heads late cabbage .....	.06	510.00
375 bushels beets .....	.50	187.50
1,500 heads early celery .....	.07	105.00
4,000 heads late celery .....	.16	640.00
239 bushels onions .....	1.00	239.00
370 bushels parsnips .....	1.00	370.00
415 bushels summer squash.....	1.00	415.00
25 bushels peppers .....	1.00	25.00
100 heads red cabbage .....	.10	10.00
200 heads cauliflower .....	.15	30.00
937 boxes strawberries .....	.18	168.66
400 bushels carrots .....	.50	200.00
625 bushels strap leaf turnips....	.85	531.25

340 bushels rutabagas .....	\$1.00	\$340.00
530 dozen bunches radishes .....	.25	132.50
22 tons hay .....	18.00	396.00
178,425 quarts milk .....	.07	12,489.75
16,398 pounds pork .....	.13	2,131.74
14 tons grass for soiling.....	14.00	196.00
634 tons ensilage corn.....	3.75	2,377.50
22 tons hay .....	18.00	396.00
131 pigs sold .....	2.50	327.50
23 calves sold .....	2.00	26.00
1,042 pounds beef for use.....	.09	93.78
4 hides sold .....		26.57
1 cow sold .....	45.00	45.00
6,624 cakes of ice.....	.08	529.92
		<hr/>
		\$26,796.97

## PRODUCTS OF THE FARM AT SUNNYSIDE FOR THE YEAR 1910.

1,189 bushels potatoes .....	\$0.65	\$772.85
30 bushels carrots .....	.10	3.00
15 bushels parsnips .....	1.00	15.00
30 bushels beets .....	.50	15.00
120 dozen cucumbers .....	.20	24.00
20 bushels peas .....	1.00	20.00
14 bushels tomatoes .....	1.25	17.50
1 ton squash .....	28.00	28.00
10 bushels string beans.....	.80	8.00
12 bushels shell beans .....	1.25	15.00
2,000 heads lettuce .....	.03	60.00
1,000 dozen corn .....	.14	140.00
1,000 lbs. rhubarb .....	.01	10.00
120 dozens bunches radishes .....	.25	30.00
1,700 heads cabbage .....	.06	102.00
16 tons hay .....	18.00	288.00
1 ton bedding .....	11.00	11.00
10 tons oats .....	12.00	120.00
1 ton millet .....	10.00	10.00

5 tons corn for fodder.....	\$8.00	\$40.00
3,250 quarts raspberries .....	.18	585.00
2,080 quarts strawberries .....	.12	249.60
800 pounds pork .....	.20	160.00
100 quarts blackberries .....	.10	10.00
144 quarts currants .....	.10	14.40
3,500 quarts milk .....	.07	245.00
120 gallons maple syrup.....	.85	102.00
14 ducks .....	1.00	14.00
64 chickens .....	.38	24.32
400 cakes of ice .....	.08	32.00
3,382 dozen eggs .....	.35	1,183.70
65 barrels apples .....	2.50	162.50
		<hr/>
		\$4,511.87

## APPENDIX.





## APPENDIX.

---

### DIRECTIONS CONCERNING ADMISSION.

Those wishing the admission of a person to the hospital should make application to the superintendent previously to bringing the patient, unless the urgency of the case precludes it.

On application, full information as to terms, conditions, etc., and the necessary papers, will be furnished.

With the application, a brief statement of the case should be given.

Some person should accompany the patients who can give a correct history of the case, if possible.

On no account should deception be practiced. The necessity of this step and the arrangements having first been settled, the patient should be honestly informed of what is to take place.

When possible, it is better that patients should arrive in day trains.

Patients should not bring valuable property when committed, and the hospital cannot become responsible for its keeping. Such articles should be left at home, unless the patient is fully responsible for their care.

The parties committing a private patient are required to give a bond for the payment of expenses in the annexed form, signed by two responsible persons. The certificates of physicians should be filled and signed in all cases, except those committed by courts, and be written in the annexed form

## FORM OF BOND.

In consideration of the admission of \_\_\_\_\_, of the town of \_\_\_\_\_, in the county of \_\_\_\_\_, and state of \_\_\_\_\_, as a boarder at the New Hampshire State Hospital, in the city of Concord, we \_\_\_\_\_, of the town of \_\_\_\_\_, in the county of \_\_\_\_\_, and state of \_\_\_\_\_, and \_\_\_\_\_, of the town of \_\_\_\_\_, in the county of \_\_\_\_\_, and state of \_\_\_\_\_, jointly and severally promise and agree to and with said New Hampshire State Hospital, to pay its treasurer \_\_\_\_\_ dollars and \_\_\_\_\_ cents per week, or such other rate as may from time to time be established by said hospital therefor, while he shall remain at said hospital; together with such extra charge as may be occasioned by \_\_\_\_\_ requiring more than the ordinary care and attention; to pay any reasonable charge for actual damage done by \_\_\_\_\_ to buildings or furnishings; to assist in returning \_\_\_\_\_ to said hospital in case of escape; to remove \_\_\_\_\_ from said hospital when required to do so by the superintendent; to pay funeral charges in case of death; and not to hold said hospital responsible for any money, jewelry, watches or other valuables in possession on admission or given to \_\_\_\_\_ afterwards.

Payments to be made quarterly, and interest on all sums not paid at the end of each quarter.

Witness our hands this \_\_\_\_\_ day of \_\_\_\_\_, 191 .

Attest:

*Principal.* [L. s.]

*Surety.* [L. s.]

NOTE.—Those committing patients are requested to notice the condition in regard to money, jewelry, etc.

## FORM OF PETITION.

To be filled and signed by those desiring aid from the state appropriation,  
to be sent to the superintendent.

*To His Excellency the Governor of the State of New Hampshire:*

Respectfully represents that \_\_\_\_\_, an insane person,  
resident of \_\_\_\_\_, in this state, is without sufficient  
property or relatives legally liable for \_\_\_\_\_ support at  
the New Hampshire State Hospital. Wherefore the un-  
dersigned prays that the said \_\_\_\_\_ be aided by any  
funds appropriated by the state for the indigent insane.

Dated at \_\_\_\_\_, 191 \_\_\_\_\_,

We, the undersigned, selectmen of \_\_\_\_\_, hereby cer-  
tify that the representations in the above petition are in our  
belief true, and that said \_\_\_\_\_ is an indigent insane  
person.

N. B.—Please write whether the insane person has any  
property, and if so, what amount, and any other facts you  
may think proper in relation to the ability of the insane  
person's near relatives.

NOTE.—The amount received by the applicant, it will be understood, is  
regulated entirely by the number who may apply for aid, and the compara-  
tive need of assistance.

## FORM OF CERTIFICATE OF INSANITY.

## REQUIRED FOR ADMISSION OF PATIENTS.

After due inquiry and personal examination of \_\_\_\_\_,  
of \_\_\_\_\_, made within one week prior to date, we  
certify that \_\_\_\_\_ is insane, and fit subject for  
treatment at the New Hampshire State Hospital.

....., M. D.

....., M. D.

..... 191 .

Having personal acquaintance with the signers of the above certificate, I certify that the signatures are genuine, and the signers reputable physicians.

.....  
 .....  
 ..... 191 .

#### EXTRACT FROM THE LAWS OF NEW HAMPSHIRE.

**SECTION 18.** No person shall be committed to the New Hampshire State Hospital, except by the order of the court or the judge of probate, without the certificate of two reputable physicians that such person is insane, given after a personal examination made within one week of the committal; and such certificate shall be accompanied by a certificate from the judge of the supreme court, or court of probate, or mayor, or chairman of the selectmen, testifying to the signatures and the respectability of the signers.

The physicians making such examination shall be legally registered to practice medicine in New Hampshire, and in the actual practice of their profession at the time of said examination and for at least three years prior thereto. They shall act jointly in making said examination and their certificate shall bear the date of said examination. Neither of said physicians shall be a relative of the person alleged to be insane, or an official of the institution to which it is proposed to commit such person. Any violation of the terms of this act may be punished by a fine not exceeding one hundred dollars. The certificate of insanity shall be in the form prescribed by the commission and shall contain the facts and circumstances upon which the judgment of the physicians is based.

#### COMMITMENT OF DEPENDENT INSANE PATIENTS.

Town or county officials committing a dependent insane patient must sign the following order for support of town or county patients which, with the medical certificate, must be sent with the patient at the time of commitment.

#### ORDER FOR SUPPORT OF TOWN AND COUNTY PATIENTS.

We, ....., hereby order the committal of ..... to the New Hampshire State Hospital at Concord, there to be supported at the expense of ....., in accordance with the statute, during ..... residence at said hospital.

.....  
 .....  
 ..... 191 .

NOTE.—To be signed by mayor, selectmen, or overseer of poor, in case of town charge; by county commissioner in case of county charge.

Town and county officials after committing a dependent insane patient to the State Hospital, can make application for state aid on the following application blank, which will be furnished by the State Board of Lunacy:

### THE STATE OF NEW HAMPSHIRE.

#### APPLICATION FOR STATE AID FOR AN INDIGENT INSANE PERSON.

This blank must be filled as completely as possible and sworn to by the proper authority. See "Special Notice."

*To the Board of Commissioners of Lunacy:*

Under the provisions of the laws of the state of New Hampshire, application is hereby made for state aid, at the New Hampshire State Hospital, for the following named person:

Name..... From what Town?.....  
 Age..... Sex..... Color..... Nativity.....  
 Civil state\* ..... How long has said person been  
 insane?..... Where is said person at the present  
 time?..... Has said person ever been an inmate of  
 any asylum for the insane?..... If so, name of insti-  
 tution ..... When, and how long there?.....  
 Condition when discharged.....  
 By whom supported at present?.....  
 Has said person any property?..... If so, state what  
 and its approximate value .....  
 .....  
 Does said person receive a pension?..... If so, how  
 much per month?..... Are there any sources  
 from which partial support at State Hospital might be  
 received?..... Has said  
 person a guardian? ..... If so, give name and  
 address ..... Give  
 name and address of nearest relative.....  
 .....

\*Whether single, married, or widowed.



Has said person any relative legally chargeable therewith that is able to support said patient wholly, or in part, at the New Hampshire State Hospital?..... If so, give address and state how much per quarter towards support will be paid.....

We have investigated the case fully and declare that the facts are as stated above.

(State official capacity.)

.....  
 .....  
 .....

.....ss.

Personally appeared the above named.....  
 .....  
 this.....day of.....19 , and made oath that the foregoing statement by them subscribed is true.

Before me,

Town.....

Justice of the Peace.

### SPECIAL NOTICE.

All applications for state aid at the New Hampshire State Hospital must be signed and sworn to:

- (a) By at least two members of the Board of Selectmen, or
- (b) By at least two members of the Board of County Commissioners, or
- (c) By the Mayor of a city and the Overseer of the Poor.

All questions in this blank must be answered.

SECT. 12. The relations of any poor person in the line of father or grandfather, mother or grandmother, children or grandchildren, of sufficient ability, shall be liable to maintain him when standing in need of relief. If he has no such relations of sufficient ability, the town wherein he has a legal settlement shall be liable for his support. (Chapter 84, P. S.)

# LAWS

## RELATING TO THE NEW HAMPSHIRE STATE HOSPITAL.

### SECTION

1. Corporate name.
2. Trustees, how appointed.
3. Tenure of office of trustees.
4. Trustees to manage affairs of hospital.
5. To appoint officers, etc.
6. Trustees not to receive compensation.
7. To make regulations.
8. May hold property in trust.
9. Shall make report annually.
10. Board of visitors and their duties.
11. State Hospital land taken for highways only by authority of legislature.
12. Property of hospital exempt from taxation.
13. Annual appropriation to library.

### COMMITMENT TO STATE HOSPITAL.

14. Parent, guardian, etc., may commit.
15. Insane paupers, how committed by town.
16. County paupers, how committed.
17. Dangerous insane persons, how committed.
18. Certificate of two physicians required to commit.
19. Regulations for commitments to the hospital to govern commitments to other institutions

### SUPPORT AT STATE HOSPITAL.

20. When county shall support insane person.

### SECTION

21. When means of support fail, counties to support on notice.
22. What inmates of hospital for insane supported by state.
23. County may recover expense paid.
24. Concord not liable.
25. Certain insane persons to be supported by state.
26. Annual appropriations for indigent insane.

### DISCHARGE FROM STATE HOSPITAL.

27. How discharged from hospital.
28. Trustees to visit hospital and hear statements of patients.
29. Superintendent to furnish stationery to patients, and transmit their letters to trustees.

### CORONER'S INQUEST IN CASE OF SUDDEN DEATH.

30. Inquest on patient suddenly deceased.

### COMMISSION OF LUNACY.

31. Insane persons wards of state.
32. Commission of lunacy.
33. Powers and duties of commission of lunacy.
34. Records and reports of commission of lunacy.
35. Superintendents to make reports to commission of lunacy.
36. Annual appropriation for expenses of commission.

SECTION 1. The hospital for the insane, at Concord, is a corporation under the name of the New Hampshire State Hospital.

SECT. 2. The government of the hospital is vested in twelve trustees appointed and commissioned by the governor, with advice of the council; and all vacancies shall be filled in the same manner.

SECT. 3. The trustees are classified and commissioned in such manner that the offices of three trustees become vacant annually.

SECT. 4. The trustees shall take charge of the property and concerns of the hospital; shall see that its affairs are conducted properly; may enter into and bind the hospital by such contracts relative to the support of patients and the affairs of the hospital as they may deem advantageous; and may receive, appropriate, control, convey or invest any property given to or owned by the hospital in such manner as they may think expedient.

SECT. 5. The trustees shall appoint a secretary, who shall keep a full and fair record of their proceedings; a treasurer, who shall give bond for the faithful discharge of his duties; and such physicians, officers, and assistants, with such salaries and allowances, as may from time to time be found necessary.

SECT. 6. No trustee shall receive any compensation for his services as trustee; but expenses necessarily incurred by him shall be paid by the hospital.

SECT. 7. The trustees may make such regulations for their own government, for the management of the hospital and all persons connected therewith, and for the admission and care of patients, and the same from time to time alter, as convenience may require.

SECT. 8. The hospital may take and hold in trust any grant or devise of real estate, or any donation or bequest of personal property, and may apply the same, unless otherwise restricted, to lessen the expenses of the indigent insane.

SECT. 9. The trustees shall make to the governor and council, annually, a report, covering that of the superin-

tendent to them, of the receipts and expenditures of the hospital, the number of patients admitted and discharged during the year, and all other matters connected with the general interests of the hospital. It shall be filed in the office of the secretary of state on or before the first day of December.

SECT. 10. The governor and council, president of the senate and speaker of the house, shall constitute a board of visitors of the hospital; shall visit and inspect the same when necessary, examine into the condition of the patients and the regulation and general management of the hospital; see that the design thereof is carried into full effect; and make to the legislature at each biennial session a report which shall be furnished to the secretary of state on or before the first day of December next preceding such session.

SECT. 11. No land connected with the hospital shall be taken for a highway or other public use, except by the express authority of the legislature, for that purpose first had and obtained.

SECT. 12. The property of the hospital is exempted from taxation.

SECT. 13. The sum of one hundred dollars is annually appropriated toward the support and increase of the library of the hospital.

#### COMMITMENT TO STATE HOSPITAL.

SECT. 14. The parent, guardian or friends of any insane person may cause him to be committed to the hospital, with the consent of the trustees, and there supported on such terms as they may agree upon.

SECT. 15. Any insane pauper supported by a town may be committed to the hospital by order of the overseers of the poor, and there supported at the expense of the town.

SECT. 16. If the overseers neglect to make such order in relation to any insane county pauper, the supreme court, or any judge thereof in vacation, may order such pauper to be

committed to the hospital, and there supported at the expense of the county.

SECT. 17. If any insane person is in such condition as to render it dangerous that he should be at large, the judge of probate, upon petition by any person and such notice to the selectmen of the town in which such insane person is, or to his guardian or any other person, as he may order, may commit such insane person to the hospital; and such petition may be filed, notice issued and hearing had in vacation or otherwise.

SECT. 18. No person shall be committed to the State Hospital, except by an order of the court or the judge of probate, without the certificate of two reputable physicians that such person is insane, given after a personal examination made within one week of the committal. Such certificate shall be accompanied by a certificate of a judge of the supreme court or court of probate, mayor, or one of the selectmen, certifying to the genuineness of the signatures and the respectability of the signers.

SECT. 19. All laws relative to the commitment of insane persons to the New Hampshire State Hospital shall govern the commitment of insane persons to all other places in this state where insane persons are confined; but no insane person, other than a pauper, shall be admitted to any county asylum.

#### SUPPORT AT STATE HOSPITAL.

SECT. 20. Any insane person committed to the hospital by his parent, guardian or friends, who has no means of support and no relatives of sufficient ability chargeable therewith, and no settlement in any town in this state, and who is in such condition that his discharge therefrom would be improper or unsafe, shall be supported by the county from which he was committed.

SECT. 21. When the means of support of any inmate of the hospital shall fail or be withdrawn, the superintendent shall immediately cause notice in writing of the fact to be given to one of the county commissioners of the county from

which such inmate was committed; and such county shall pay to the hospital the expense of the support of such inmate from and after the service of such notice, and for ninety days next prior thereto.

SECT. 22. Any insane person charged with an offense, the punishment whereof is death or confinement in the state prison, committed to the hospital by order of the supreme court, shall be supported at the expense of the state during his confinement there. Any other insane person committed to the hospital by the supreme court or a judge thereof, and any insane person committed by a judge of probate, shall be supported by the county from which he was committed.

SECT. 23. The county or town paying the expense of the support of an inmate of the hospital shall be entitled to recover the amount so paid of the inmate himself, if of sufficient ability to pay; otherwise of the town, county or person by law liable for his support.

SECT. 24. The city of Concord shall not be liable for the support of any insane person committed to the hospital unless he was committed from said city.

SECT. 25. Any insane person who has been an inmate of the State Hospital for twenty years, and been supported in whole or in part during that time by others than the town or county chargeable therewith, and who has no means of support and no relations chargeable therewith, and who cannot properly be discharged from the hospital, shall be supported there at the expense of the state.

SECT. 26. The sum of six thousand dollars (\$6,000) is annually appropriated for the support of the State Hospital of such indigent insane persons belonging to the state as the governor, from time to time, may designate; but two thirds at least of the sum shall be applied to the support of private patients who are not maintained at public charge.

#### DISCHARGE FROM STATE HOSPITAL.

SECT. 27. Any person committed to the State Hospital may be discharged by any three of the trustees, by the com-



mission of lunacy or by a justice of the supreme court, whenever a further retention at the hospital is, in their opinion, unnecessary; but any person so discharged who was under sentence of imprisonment at the time of his commitment, the period of which shall not have expired, shall be remanded to prison.

SECT. 28. Some of the trustees, without previous notice, shall visit the hospital at least twice every month, and give suitable opportunity to every inmate therein to make to him, in private, any statements such patient may wish to make; and, whenever he deems it proper, he shall call to his aid two other trustees, who shall, with him, make a further examination of such inmate and of the statements by him made. If, in their judgment, a further detention is unnecessary, it shall be their duty to discharge such inmate. They may order such immediate change in the treatment of any inmate as they may deem judicious; and, in case of failure to secure it, they shall at once summon a meeting of the whole board, whose duty it shall be to take such measures as the exigency of the case demands.

SECT. 29. The superintendent shall furnish stationery to any inmate who desires it; and shall transmit promptly and without inspection, to the trustee whom the board may designate, all letters addressed to the board by the inmates of the hospital.

#### CORONER'S INQUEST IN CASE OF SUDDEN DEATH.

SECT. 30. In event of the sudden death of any inmate, a coroner's inquest shall be held, as provided for by law in other cases.

#### COMMISSION OF LUNACY.

SECT. 31. All persons deprived of their liberty in this state by being committed to custody as insane persons, shall be wards of the state and subject to state supervision.

SECT. 32. The State Board of Health shall constitute a commission of lunacy.

SECT. 33. The commission, by one or more of their members, shall, without previous notice, visit and make thorough inspections of all asylums and other institutions for insane persons in the state, as often as once in four months. They shall examine into the care and treatment of the insane, the sanitary condition of each asylum or institution, and all other matters relating to the general welfare of the inmates. They may order the removal of any indigent insane person to the New Hampshire State Hospital for remedial treatment, and such person while under treatment shall be supported at the expense of the state. When the need of such treatment shall cease, the commission shall so notify the county, town or relative liable for the support of such inmate, and if he is longer continued at the hospital it shall be at the expense of such county, town or relative.

SECT. 34. The commission shall keep a correct record of the number of commitments, discharges and deaths at each asylum, institution or other place of detention, and of the age, sex and nationality of each person committed, discharged or deceased, and shall report the same annually to the governor and council, with any other matters or recommendations which in their judgment are important.

SECT. 35. The superintendent of every asylum or other place in this state where insane persons are confined, shall within three days after the commitment thereto of any person, notify the commission thereof, upon blanks furnished for that purpose; and the said superintendent shall at all times furnish to the board such information regarding the insane in his charge as they may request.

SECT. 36. To meet the expenses imposed upon the commission by the foregoing sections, the sum of twelve hundred dollars (\$1,200), or so much thereof as may be required, is annually appropriated; and the expenditures shall be audited by the governor and council.

—*Public Statutes of N. H., Chapter 10.*

SECT. 4. The following persons are also exempted from military duty:

the attendants upon the insane, employed in the State Hospital;

the officers and keepers of the State Hospital.

—*Public Statutes, Chapter 96.*

SECTION 1. Whenever the grand jury shall omit to find an indictment against a person, for the reason of insanity or mental derangement, or a person prosecuted for an offense shall be acquitted by the petit jury for the same reason, such jury shall certify the same to the court.

SECT. 2. Any person prosecuted for an offense may plead that he is not guilty by reason of insanity or mental derangement and such plea may be accepted by the state's counsel, or may be found true by the verdict of the jury.

SECT. 3. In either of the cases aforesaid, the court, if they are of the opinion that it will be dangerous that such person should go at large, may commit him to the prison or to the State Hospital, there to remain until he is discharged by due course of law.

SECT. 4. The governor and council or the supreme court may discharge any such person from prison, or may transfer any prisoner who is insane to the State Hospital, to be there kept at the expense of the state, whenever they are satisfied that such discharge or transfer shall be conducive to the health and comfort of the person and the welfare of the public.

SECT. 5. If any insane person is confined in jail, or a house of correction, the supreme court may order him to be committed to the hospital if they think it expedient.

—*Public Statutes, Chapter 255.*

AN ACT in addition to chapter 10 of the Public Statutes, relating to insane persons.

SECTION 1. When application is made to the judge of probate, or the supreme court or any justice thereof, for the

committal of any person to the State Hospital, said court or judge may appoint two reputable physicians to examine said person, with or without notice to him or her from said court or judge; said physicians shall immediately report the result to said court or judge, who may, upon such report, and such evidence as can be produced, order said person to be committed to said hospital when there is a sufficient reason for making such order.

SECT. 2. Said supreme court, or any justice thereof, shall at any time, with or without notice, upon application and due cause shown, investigate the question whether there is sufficient reason for the detention in said hospital of any person who has been committed thereto, and shall order his or her discharge where said order ought to be made, with or without a writ.

[Approved February 26, 1845.]

JOINT RESOLUTION with reference to the title of the property of the New Hampshire State Hospital.

*Resolved by the Senate and House of Representatives in General Court convened:*

WHEREAS, The entire property of the New Hampshire State Hospital is owned by the state of New Hampshire, either absolutely or in trust, but the legal title of the land, buildings and other property stands in the name of the trustees of the asylum appointed by the state, and

WHEREAS, It is desirable that the legal title should conform to the actual title, therefore,

*Be it enacted by the Senate and House of Representatives in General Court convened:*

That the attorney-general be directed to examine the deeds and other conveyances of title to said property, and advise the trustees what conveyances, if any, should be made to perfect the legal title of the state to said property, and the trustees be directed to execute such conveyances as may be advised by the attorney-general, and deliver the

same to the governor and council in behalf of the state, within sixty days from the passage of this resolution.

[Approved March 24, 1897.]

AN ACT in relation to the New Hampshire State Hospital.  
*Be it enacted by the Senate and House of Representatives  
in General Court convened:*

SECTION 1. No change shall be made by the trustees of the New Hampshire State Hospital of its trust funds, except upon approval by the governor and council. In making any investments of its trust funds, the trustees shall submit their recommendations to the governor and council before such investments are made. The governor and council may also direct in whose custody the bonds, notes, and other securities of the institution shall be kept.

SECT. 2. The auditing of the accounts of the trustees, or any agent appointed by them, shall be performed by the bank commissioners, under the direction of the governor and council, who shall have authority at any time to direct said commissioners to make an examination of the financial affairs of the institution.

SECT. 3. Before expending any money received from any source in the construction of new buildings, the trustees shall submit plans and estimates of all such buildings to the governor and council for their approval.

SECT. 4. This act shall take effect upon its passage.

[Approved March 25, 1897.]

AN ACT in amendment of section 33 of chapter 10 of the Public Statutes, relating to the commission of lunacy.

*Be it enacted by the Senate and House of Representatives  
in General Court convened:*

SECTION 1. Section 33 of chapter 10 of the Public Statutes is hereby amended by inserting after the word "state" in the eleventh line the words "such expense not to exceed in any one year the sum of sixteen thousand dollars (\$16,000) for all such persons," so that said section, as amended, shall



read: "SECT. 33. The commission, by one or more of their members, shall, without previous notice, visit and make thorough inspections of all asylums and other institutions for insane persons in the state, as often as once in four months. They shall examine into the care and treatment of the insane, the sanitary condition of each asylum or institution, and all other matters relating to the general welfare of the inmates. They may order the removal of any indigent insane person to the New Hampshire State Hospital for remedial treatment, and such person, while under such treatment, shall be supported at the expense of the state, such expense not to exceed in any one year the sum of sixteen thousand dollars (\$16,000) for all such persons. When the need of treatment shall cease, the commission shall so notify the county, town, or relative liable for the support of such inmate, and if he is longer continued at the hospital, it shall be at the expense of such county, town or relative."

SECT. 2. This act shall take effect and be in force from and after June 1, 1897.

[Approved March 26, 1897.]

AN ACT relating to insane criminals.

*Be it enacted by the Senate and House of Representatives in General Court convened:*

SECTION 1. When a person is indicted for any offense or is committed to jail on any criminal charge to await the action of the grand jury, any justice of the court before which he is to be tried, if a plea of insanity is made in court, or said justice is notified that such plea will be made, may, in term time or vacation, order such person into the care and custody of the superintendent of the New Hampshire State Hospital, to be detained and observed by him until further order of the court, that the truth or falsity of the plea may be ascertained.

SECT. 2. The person so committed shall be there supported at his own expense, if he has sufficient means; otherwise at the expense of the state.



SECT. 3. All acts and parts of acts inconsistent with this act are hereby repealed, and this act shall take effect upon its passage.

[Approved February 20, 1901.]

AN ACT to change the name of the New Hampshire Asylum for the Insane.

*Be it enacted by the Senate and House of Representatives in General Court convened:*

SECTION 1. Section 1 of chapter 10 of the Public Statutes is hereby amended by striking out the words "Asylum for the Insane," and inserting in place thereof the words "State Hospital," so that, when amended, the section will read: "The Asylum for the Insane at Concord is a corporation under the name of the New Hampshire State Hospital."

SECT. 2. Whenever the words "New Hampshire Asylum for the Insane" occur in the subsequent sections of chapter 10, and in laws passed in amendment thereof, the words "New Hampshire State Hospital" shall be substituted.

[Approved February 27, 1901.]

AN ACT entitled An Act to provide for the care and support of the dependent insane by the State.

*Be it enacted by the Senate and House of Representatives in General Court convened:*

SECTION 1. The state, from and after the first day of January, 1909, shall have the care, control, and treatment of all insane persons who are now cared for at the county almshouses; and no county shall hereafter establish any asylum or other additional structure for care of the insane, nor after said date maintain any institution for the insane, or be liable for the board, treatment, care, or act of any insane person.

SECT. 2. From and after the passage of this act the state board of lunacy may order the removal of all such dependent insane persons to the state hospital, for remedial treat-

ment, as in their judgment seems proper, and such persons shall be supported at the expense of the state from money in the treasury not otherwise appropriated.

SECT. 3. After January 1, 1905, as rapidly as accommodations can be provided, the state board of lunacy shall begin making transfers from the various county almshouses to the state hospital of such insane persons as in their judgment seem most suitable, and all such patients, after their removal to the state hospital, shall be maintained therein at the expense of the state. Such transfers shall be made by the state board of lunacy pro rata to the population of the several counties.

SECT. 4. This act shall take effect upon its passage. All acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

[Approved March 7, 1903.]

AN ACT in amendment of section 27 of chapter 10 of the Public Statutes relating to discharges from the New Hampshire State Hospital.

*Be it enacted by the Senate and House of Representatives in General Court convened:*

SECTION 1. Section 27 of chapter 10 of the Public Statutes is hereby amended by adding thereto at the end thereof the following sentence: The superior court or any justice thereof may, with or without notice, in term or vacation, on due cause shown, parole any person committed to the New Hampshire State Hospital upon such terms and conditions as justice may require; and said court or justice may at any time thereafter, on due cause shown, revoke said parole and order said person returned to said State Hospital under the original commitment.

SECT. 2. This act shall take effect upon its passage.

[Approved March 10, 1905.]

AN ACT to provide additional accommodations at the New Hampshire State Hospital.

*Be it enacted by the Senate and House of Representatives in General Court convened:*

SECTION 1. That, to provide additional accommodations for the care, control, and treatment of insane persons, as contemplated by chapter 61 of the Laws of 1903, the sum of two hundred thousand dollars be, and hereby is raised and appropriated for the purpose of the erection of a hospital building, and securing therefor the necessary furnishing, heating, lighting, plumbing, water facilities, and fire protection, at an expense not exceeding one hundred and fifty thousand dollars, the construction of six iron fireproof stairways, at an expense not exceeding twenty-five thousand dollars, the erection of a storehouse, including cold storage facilities, at an expense not exceeding fifteen thousand dollars, the erection of an employees' building, including lighting, furnishing, and plumbing, at an expense not exceeding ten thousand dollars, in accordance with plans and specifications to be approved by the governor and council; said sums to be expended under the direction of the trustees of said institution. And any balance of said sum of two hundred thousand dollars, or the proceeds of the bonds hereinafter provided for, not required for the several purposes above enumerated, may be used for any other necessary enlargement, or changes, of existing buildings of the State Hospital, which may be approved by the governor and council, and to be in accordance with plans and specifications to be also approved by the governor and council.

SECT. 2. The state treasurer is hereby authorized, under the direction of the governor and council, to borrow said sum of two hundred thousand dollars, on the credit of the state; and to issue bonds, or certificates of indebtedness therefor, in the name and on behalf of the state, ten thousand dollars thereof to be paid annually, beginning on July 1, 1906, at a rate of interest not exceeding three and one half

percent per annum, payable semiannually, on the first days of January and July of each year; such bonds to have interest warrants or coupons attached thereto; said coupons to be signed by the state treasurer, and said bonds and coupons to be made payable at such place as the governor and council shall designate.

SECT. 3. Said bonds shall be designated New Hampshire State Hospital Bonds, and shall be signed by the treasurer, and countersigned by the governor, and shall be deemed a pledge of the faith and credit of the state. The secretary of state shall keep a record of all bonds countersigned by the governor, showing the number and amount of each bond, the time of countersigning, the time when payable, and the date of the delivery to the state treasurer. The treasurer shall keep a record of all bonds disposed of by him, showing the number thereof, the name of the person to whom sold, the amount received for the same, the date of the sale, and the time when payable. The treasurer may negotiate and sell such bonds to the best advantage for the state, but no bond shall be sold for less than its par value, nor shall such bonds be loaned, pledged or hypothecated in any way whatever.

SECT. 4. The governor shall draw his orders on the state treasurer, for the amounts that may be, or become, due from time to time, under the contracts of the trustees, approved by the governor and council, for the purposes aforesaid, after said bills shall have been duly approved by the governor and council, to an amount not exceeding the proceeds of said bonds.

SECT. 5. This act shall take effect upon its passage.

[Approved March 10, 1905.]

AN ACT to provide for purchasing supplies for state institutions by competitive bids in the open market.

*Be it enacted by the Senate and House of Representatives in General Court convened:*

SECTION 1. In the purchase of supplies for all state institutions competitive bids in the open market shall be required

after April 1, 1905, in accordance with such rules and regulations as the governor and council shall prescribe. No bills for supplies furnished to state institutions shall be approved by the governor and council, or paid by the state treasurer or by an agent of the state authorized to extend its funds for these institutions unless the bills were contracted in accordance with the provisions of this act.

SECT. 2. The governor and council may, in cases where unforeseen emergency requires immediate purchase, authorize purchases under the rules and regulations prescribed in section 1.

SECT. 3. Any person violating the provisions of this act shall be subject to a fine of not less than one hundred dollars nor more than two hundred dollars.

[Approved March 10, 1905.]

#### STATE INSTITUTIONS.

AN ACT to provide additional accommodations at the New Hampshire State Hospital.

*Be it enacted by the Senate and House of Representatives in General Court convened:*

SECTION 1. That, to provide additional accommodations for the care, control, and treatment of insane persons, as contemplated by chapter 61 of the Laws of 1903, the sum of one hundred and fifty thousand dollars be, and hereby is, raised and appropriated for the purpose of enlarging the present Kent building for women patients of the disturbed class, the enlargement of the present Peaslee building for men patients of a similar class, to provide a special ward, or wards, for such of the criminal and convict insane as may be committed to said hospital by order of the court or transferred thereto from the state prison by order of the governor and council, the extension and enlargement of the present laundry and depot, including the necessary furnishing, heating, lighting, plumbing, water facilities, and fire protection for said additions and enlargements, in accord-



ance with plans and specifications to be approved by the governor and council; said sum to be expended under the direction of the trustees of said institution. And any balance of said sum of one hundred and fifty thousand dollars or the proceeds of the bonds hereinafter provided for, not required for the several purposes above enumerated may be used for any other necessary enlargement, equipment or changes of existing buildings of the State Hospital which may be approved by the governor and council, and to be in accordance with plans and specifications to be also approved by the governor and council.

SECT. 2. The state treasurer is hereby authorized, under the direction of the governor and council, to borrow said sum of one hundred and fifty thousand dollars on the credit of the state; and to issue bonds, or certificates of indebtedness therefor, in the name and on behalf of the state, payable on July 1, 1927, at a rate of interest not exceeding three and one half percent per annum, payable semiannually, on the first days of January and July of each year; such bonds to have interest warrants, or coupons, attached thereto; said coupons to be signed by the state treasurer, and said bonds and coupons to be made payable at such places as the governor and council shall designate.

SECT. 3. Said bonds shall be designated New Hampshire State Hospital Bonds, and shall be signed by the treasurer, and countersigned by the governor, and shall be deemed a pledge of faith and credit of the state. The secretary of state shall keep a record of all bonds countersigned by the governor, showing the number and amount of each bond, the time of countersigning, the time when payable, and the date of the delivery to the state treasurer. The treasurer shall keep a record of all bonds disposed of by him, showing the number thereof, the name of the person to whom sold, the amount received for the same, the date of the sale, and the time when payable. The treasurer may negotiate and sell such bonds to the best advantage for the state, but no bond shall be sold for less than its par value, nor shall such



bonds be loaned, pledged, or hypothecated in any way whatever.

SECT. 4. Said bonds when owned by residents or savings banks of this state shall be exempt from taxation.

SECT. 5. The governor shall draw his orders on the state treasurer for the amounts that may be, or become, due from time to time, under the contracts of the trustees, approved by the governor and council, for the purposes aforesaid, after said bills shall have been duly approved by the governor and council, to an amount not exceeding the proceeds of said bonds.

SECT. 6. To provide funds for the purposes enumerated in section 1 of this act, pending the sale of said bonds, as above provided, the governor and council may, and hereby are authorized to borrow money on the credit of the state, to an amount not exceeding seventy-five thousand dollars (\$75,000), and to use an amount of the avails of said bonds, when sold, sufficient to pay the principal and interest of the money so borrowed.

SECT. 7. This act shall take effect upon its passage.

[Approved March 13, 1907.]

AN ACT to provide for the indigent insane.

*Be it enacted by the Senate and House of Representatives in General Court convened:*

SECTION 1. The state board of commissioners of lunacy is hereby empowered to transfer any indigent insane person to the New Hampshire State Hospital, there to be supported by the state, provided satisfactory affidavits are executed by the selectmen, or county commissioners, or both, as the said board may require, to the effect that neither the patient nor any relative chargeable therewith is able to bear the expense incident to his maintenance at the said hospital.

SECT. 2. Indigent insane persons at the New Hampshire State Hospital, for remedial treatment or otherwise, may be maintained by the state at the said hospital upon orders issued to that effect by the state board of commissioners of

lunacy, having first in each case obtained satisfactory evidence as provided for in section 1 of this act.

SECT. 3. In a case where the patient or relatives chargeable with his support are able to pay only a part of the expense of maintaining the said patient at the New Hampshire State Hospital, the state board of commissioners of lunacy, upon satisfactory evidence of the facts, may direct that such part of the expense of maintenance at the said hospital as cannot be met by the patient or relatives chargeable therewith be paid by the state.

SECT. 4. All acts and parts of acts inconsistent with this act are hereby repealed, and this act shall take effect upon its passage.

[Approved April 3, 1907.]

AN ACT to secure uniformity in official reports.

*Be it enacted by the Senate and House of Representatives in General Court convened:*

SECTION 1. Every report now required by law to be issued annually by any state official or state board shall close on August 31, 1907; and thereafter such reports shall cover annual periods from September 1 to August 31, inclusive. Every report now required by law to be issued biennially by any state official or state board, shall close on August 31, 1908; and thereafter such reports shall cover biennial periods from September 1 to August 31, inclusive. All state reports shall contain a comprehensive and detailed financial statement.

SECT. 2. All acts and parts of acts inconsistent with this act are hereby repealed and this act shall take effect upon its passage.

[Approved April 2, 1907.]

AN ACT in addition to and in amendment of chapter 10 of the Public Statutes relating to the commitment and support of insane persons.

*Be it enacted by the Senate and House of Representatives in General Court convened:*

SECTION 1. Amend section 18 of chapter 10 of Public Statutes of the State of New Hampshire, by adding to the end thereof the following: "The physicians making such examination shall be legally registered to practice medicine in New Hampshire, and in the actual practice of their profession at the time of said examination and for at least three years prior thereto. They shall act jointly in making said examination and their certificate shall bear the date of said examination. Neither of said physicians shall be a relative of the person alleged to be insane, or an official of the institution to which it is proposed to commit such person. Any violation of the terms of this act may be punished by a fine not exceeding one hundred dollars. The certificate of insanity shall be in the form prescribed by the commission and shall contain the facts and circumstances upon which the judgment of the physicians is based.

SECT. 2. All acts and parts of acts inconsistent with this act are hereby repealed, and this act shall take effect upon its passage.

[Approved April 8, 1909.]

AN ACT to provide additional facilities at the New Hampshire State Hospital.

*Be it enacted by the Senate and House of Representatives in General Court convened:*

SECTION 1. That the sum of eighty-five thousand dollars be, and hereby is, raised and appropriated for the purpose of erecting a new heat, light, and power plant, equipping the same and connecting it with the various buildings, for the extension of the water main to the barns, and for repairs on the old Peaslee building, in accordance with plans and

specifications to be approved by the governor and council; said sum to be expended under the direction of the trustees of said institution. And any balance of said sum of eighty-five thousand dollars, or the proceeds of the bonds hereinafter provided for, not required for the several purposes above enumerated may be used for any other necessary enlargement, equipment or changes of existing buildings of the state hospital which may be approved by the governor and council, and to be in accordance with plans and specifications to be also approved by the governor and council.

SECT. 2. The state treasurer is hereby authorized, under the direction of the governor and council, to borrow said sum of eighty-five thousand dollars on the credit of the state; and to issue bonds, or certificates of indebtedness therefor, in the name and on behalf of the state, payable on July 1, 1929, at a rate of interest not exceeding three and one half percent per annum, payable semiannually, on the first days of January and July of each year; such bonds to have interest warrants, or coupons, attached thereto; said coupons to be signed by the state treasurer, and said bonds and coupons to be made payable at such places as the governor and council shall designate.

SECT. 3. Said bonds shall be designated New Hampshire State Hospital Bonds, and shall be signed by the treasurer, and countersigned by the governor, and shall be deemed a pledge of the faith and credit of the state. The secretary of state shall keep a record of all bonds countersigned by the governor, showing the number and amount of each bond, the time of countersigning, the time when payable, and the date of the delivery to the state treasurer. The treasurer shall keep a record of all bonds disposed of by him, showing the number thereof, the name of the person to whom sold, the amount received for the same, the date of the sale, and the time when payable. The treasurer may negotiate and sell such bonds to the best advantage for the state, but no bond shall be sold for less than its par value nor shall such bonds be loaned, pledged, or hypothecated in any way whatever.

SECT. 4. Said bonds when owned by residents or savings banks of this state shall be exempt from taxation.

SECT. 5. The governor shall draw his orders on the state treasurer for the amounts that may be, or become, due from time to time, under the contracts of the trustees, approved by the governor and council, for the purposes aforesaid, after said bills shall have been duly approved by the governor and council, to an amount not exceeding the proceeds of said bonds.

SECT. 6. To provide funds for the purposes enumerated in section 1 of this act, pending the sale of said bonds, as above provided, the governor and council may, and hereby are authorized to, borrow money on the credit of the state, to an amount not exceeding fifty thousand dollars (\$50,000), and to use an amount of the avails of said bonds, when sold, sufficient to pay the principal and interest of the money so borrowed.

SECT. 7. This act shall take effect upon its passage.

[Approved April 9, 1909.]

AN ACT authorizing the trustees of the New Hampshire State Hospital to purchase a burial lot, and to provide for the burial therein of deceased dependent insane inmates of the Hospital.

*Be it enacted by the Senate and House of Representatives in General Court convened:*

SECTION 1. The trustees of the New Hampshire State Hospital are hereby authorized and empowered to purchase, on behalf of the state, a suitable lot, costing not exceeding three hundred dollars, for the burial of deceased dependent insane inmates of the hospital, and the governor, with the advice and consent of the council, is hereby authorized to draw a warrant upon the state treasurer for the payment of such cost, from any money in the treasury not otherwise appropriated.

SECT. 2. The said trustees are further hereby authorized and empowered to cause to be buried, at the expense of the

state, in the lot purchased under the authority conferred by section 1, any inmate of the hospital who dies, and who, while living, was supported at the expense of the state, and who has no kindred or friends who will give the deceased a decent burial elsewhere at their own expense.

SECT. 3. This act shall take effect upon its passage.

[Approved March 30, 1909.]



## BY-LAWS

OF THE NEW HAMPSHIRE STATE HOSPITAL, ADOPTED BY  
THE TRUSTEES AT A MEETING OF THEIR BOARD HOLDEN  
OCTOBER 31, 1878, WITH SUBSEQUENT AMENDMENTS.

SECTION 1. The annual meeting of the board of trustees of the New Hampshire State Hospital shall be holden at the State Hospital, in Concord, on the third Thursday of November of each year, and there shall also be held in addition stated meetings of the trustees on the third Thursday of February, May, and August of each year, at any of which meetings any business shall be in order other than that of the election of officers.

SECT. 2. The trustees shall, at the annual meeting, elect by ballot a president, secretary, and treasurer, who shall hold their respective offices one year, and until others are chosen in their stead. At times, when either of said offices is vacant, it may be filled at a special meeting of the trustees duly called for that purpose.

SECT. 3. Notice of the annual and stated meetings shall be given by the secretary to each trustee, either verbally or by mail, at least fourteen days previous to the day of meeting; and any meeting may be continued by adjournment, from time to time, until the business thereof shall be completed. In case of omission to notify the annual meeting, the same shall not be lost, but shall be considered as adjourned for the transaction of business, until the required notice thereof shall be given, which the secretary shall forthwith proceed to give.

SECT. 4. The president, or any four of the trustees, may call a special meeting of the trustees whenever in the opinion

of either it may be deemed expedient so to do; and the same notice shall be given of a special as of the annual meeting, which notice shall state specifically the business to be brought before such meeting. In case of a vacancy in the office of secretary, the president shall notify the annual meeting.

SECT. 5. A majority of the members of the board shall constitute a quorum for the transaction of any business; but any less number, at a meeting duly called, may adjourn from time to time, until a quorum be obtained.

SECT. 6. Two of the trustees shall visit the hospital each month, and notices of the months by him selected, or to him assigned, shall be sent to each member by the superintendent before the first day of such month.

SECT. 7. No trustee shall receive any compensation for his services as trustee; but expenses necessarily incurred in rendering the same shall be paid by the hospital.

SECT. 8. The trustees shall, at each annual meeting appoint from their number an auditor, whose duty it shall be to examine the books and audit the accounts of the treasurer and of the financial agent for the ensuing year, and make a written report to the board at their annual meeting.

SECT. 9. The treasurer shall give a bond, acceptable to the trustees, in the penal sum of fifteen thousand dollars (\$15,000), for the faithful performance of his duties for and during such time as he shall continue to hold the office of treasurer, which bond shall be deposited with the president of the board.

SECT. 10. The treasurer shall receive, hold, and disburse all moneys coming to the hospital, except the permanent funds and the income thereof. He shall make an exhibit of the state of his books, and of the property in his custody, when called for by the trustees. He shall make up his accounts to the thirty-first day of August, inclusive, in each year, which accounts, with his report thereon, shall be laid before the trustees at their annual meeting. His books shall at all times be open to the examination of the trustees.

SECT. 11. The treasurer shall pay all bills approved by

the superintendent, and, in addition thereto, such orders as the superintendent may draw on him for the ordinary expenditures of the hospital, when said offices are held by different individuals.

SECT. 12. The treasurer shall receive such compensation for his services as the trustees may from time to time determine.

SECT. 13. The secretary shall attend all meetings of the board of trustees, and keep a record of their proceedings. He shall also prepare, or cause to be prepared, all documents, statements of notices which may be ordered by the board, or by the president thereof.

SECT. 14. The secretary shall receive such compensation for his services as the trustees may from time to time determine.

SECT. 15. The board of trustees shall appoint a superintendent, who shall be a physician, and reside at the hospital. He shall have the entire control of the treatment and management of the patients; the power to appoint and discharge all persons employed in their care; and shall exercise a general supervision and direction of every department of the institution.

SECT. 16. The superintendent shall make a written report to the trustees, at their annual meeting, of the condition of the hospital, and embracing such other topics as may have been suggested by the progress of the institution and the experience of the year.

SECT. 17. The superintendent shall receive for his services, in addition to furnished apartments, board, lights, and fuel for himself and family, such a salary as the trustees may from time to time determine.

SECT. 18. The superintendent shall furnish, to the acceptance of the trustees, a bond for the faithful performance of his duties, in the penal sum of ten thousand dollars (\$10,000), which bond shall be kept by the president of the hospital.

SECT. 19. The superintendent shall appoint four assist-

ant physicians, who shall reside at the hospital. They shall possess such characters and qualifications as will enable them to discharge the ordinary duties of the superintendent, and shall at all times perform such duties as he may assign them, and to his acceptance.

SECT. 20. The assistant physicians shall receive such compensation for their services as the trustees may from time to time determine, in addition to furnished apartments, lights, fuel, and board.

SECT. 21. All funds amounting to one hundred dollars (\$100) and upwards, which have heretofore been or which may hereafter be given to the New Hampshire State Hospital shall unless otherwise ordered by the donors, be entered upon the books of the financial agent as permanent funds, with the surnames of the donors attached to each, and be forever kept intact. The income of each shall be expended from time to time in accordance with the conditions upon which it was given, or, in the absence of conditions, in such manner as the trustees shall deem to be for the highest interest of the hospital and its patients.

SECT. 22. There shall be chosen, by ballot, a financial agent, who shall have charge of the permanent funds of the hospital, shall collect, and, under the advice of the finance committee, from time to time invest, manage, and disburse any moneys arising therefrom. He shall be, *ex officio*, a member of the finance committee, shall give a satisfactory bond for the faithful performance of his trust, in the sum of twenty-five thousand dollars (\$25,000), and continue in office until his successor is elected. He shall receive for his services such compensation as the trustees shall from time to time determine, and make up his accounts to the thirtieth day of September, inclusive, of each year.

SECT. 23. The trustees shall annually choose two from their board, who with the financial agent, shall constitute a finance committee, and have general supervision and control of the permanent funds of the hospital, with power to sell and transfer any stocks, bonds, and other securities

belonging to said funds, whenever, in their judgment, it may be expedient so to do.

SECT. 24. Besides attending the annual meeting, the trustees shall severally visit the hospital twice each year, in such months as they may select, or as may be assigned to them; make a thorough examination of the house and of the condition of the patients; and, before leaving, make a record of their respective visits in a book kept at the hospital for that purpose.

SECT. 25. These by-laws may be altered or amended at any annual or stated meeting by a vote of two thirds of the trustees present, or at a special meeting called for that purpose.

SECT. 26. The trustees shall at each annual meeting of the board, elect an executive committee consisting of five members, two of whom shall constitute a quorum for the transaction of business. The executive committee shall have power to fill any vacancy on its board occurring between annual meetings, and to fix its times of meeting. It shall be the duty of the executive committee to meet at the hospital on the first Wednesday of each month, to confer with and advise the superintendent in relation to matters pertaining to the hospital. The committee shall elect one of their number chairman and another member secretary. The secretary shall keep a full record of the transactions of the committee, and at each annual or stated meeting of the board a report of its transactions shall be submitted.

## NEW HAMPSHIRE STATE HOSPITAL TRAINING SCHOOL FOR NURSES.

---

ETTA MAY BAGLEY, *Superintendent of Nurses.*

C. P. BANCROFT, M. D.

C. H. DOLLOFF, M. D.

A. B. HOWARD, M. D.

J. B. MACDONALD, M. D.

M. H. TOWLE, M. D.

FANNIE M. FARMER, *Instructor in Cooking.*

The trustees of the New Hampshire State Hospital, having established a training school for nurses at that institution, offer to give women desirous of becoming professional nurses a three years' course of training in general nursing with especial reference to the care of cases of nervous and mental disease.

Those wishing to receive such instruction must apply to Dr. C. P. Bancroft, superintendent of New Hampshire State Hospital, Concord, N. H.

The most desirable age for candidates is from twenty to thirty-five years. They must be in sound health, and sufficiently interested in the subject of nursing and free from all incumbrances so that they can in all reasonable probability complete the prescribed course of two years.

The superintendent of nurses has the immediate charge of the training school under the authority of the superintendent of the hospital, and the nurses are subject to the rules of the hospital. The right is reserved to terminate the connection of any nurse or pupil with the school for any reason which may be deemed sufficient.

All nurses are required to be intelligent, trustworthy, kind, and cheerful.



The instruction includes the general care of the sick, the making of beds, changing bed and body linen, managing of helpless patients in bed, etc., giving baths, keeping patients warm or cool, prevention and dressing of bed sores, and the proper management of patients under various conditions of disease; the making and applying of bandages; the dispensing of drugs; the management of patients in accidents and emergencies; the application of poultices, the dressing of burns, ulcers, and wounds; the administering of enemas, and the use of the female catheter; the preparation of the operating room and table, sterilization of dressings and instruments, preparation of patient and after care, and the administration of anæsthetics; the sterilization of milk for infants; the care of patients with infectious diseases; massage and electricity; the use of hot and cold baths and packs.

Students in the training school receive practical nursing instruction from the superintendent of the Concord District Nursing Association, and each nurse serves six weeks in district nursing in the city of Concord. This service includes the care of general disease in the patient's home, minor surgery, and confinement cases.

A course in cooking for the sick will be given by a competent instructor from the Boston Cooking School. Instruction will be given by the superintendent of nurses, by the medical staff at the hospital, and by the physicians and surgeons resident in the city.

Students in the training school act as nurses in the various wards of the hospital during their term of service. During the first year they receive from \$3.00 to \$3.50 per week; during the second year from \$3.50 to \$4.00 per week. When the full term of two years is completed, the nurses receive, if they pass all the examinations and their service in the hospital has been satisfactory, a diploma, certifying to the completion of the regular training and practice. Nurses who have served the full course in this hospital have found ready engagements as head nurses in the hospital, with wages of \$25.00 to \$30.00 per month, or as private

nurses outside, at the regular rate secured by professional trained nurses.

Nurses are required to wear at all times while on duty in the wards the training school uniform.

The school begins in the fall, but accepted candidates may enter at any time, as vacancies occur. They are as a rule received in the order of their application.

NEW HAMPSHIRE STATE HOSPITAL,  
Concord, N. H.

### QUESTIONS TO BE ANSWERED BY CANDIDATES.

1. Name in full of candidate.
2. Are you married, single, or widow?
3. Your present occupation or employment?
4. Age last birthday, date, and place of birth?
5. Are you strong and healthy?
6. Height? Weight?
7. Are you free from domestic or other responsibilities, so that you are not liable to be called away?
8. Name of any responsible person for reference.
9. Have you ever served in any other asylum or hospital, and if so when and where?

Having read and clearly understanding and agreeing to the foregoing conditions and regulations, I declare the above statement to be correct.

Signed,

Present Address,

Date, 191 .

### GRADUATES OF THE SCHOOL.

#### CLASS OF 1890.

Ellen H. Colton.	Winifred C. Dillon.
Millie C. Geofrey.	Sarah A. Taylor.
Addie J. Eastman.	Mabel Bacon.
Y. Farouhain.	Helen F. Baker.
Mary E. Londergan.	Annie E. Harris.
Nellie Radman.	

## CLASS OF 1891.

Katherine Jones.	Gertrude Dillon.
Mary L. Wood.	Lilla M. Felch.
Clara L. Coombs.	Mabel Darling.
Laura J. Hazlitt.	

## CLASS OF 1892.

Adelaide G. Waters.	Jesse B. Lang.
Ettie E. Cook.	Elizabeth Ackland.
Nettie Kinread.	

## CLASS OF 1893.

Jennie N. Peach.	Vivia M. Lohnas.
Winnie Sleeper.	Mrs. Alma D. Hale.
Flora P. Scruton.	Agnes Marie Levinsohn.

## CLASS OF 1894.

Harriet Frances Walleston.	Annie Marion Donaven.
Lillian Alberta Cameron.	Elizabeth Helena Elliott.
Elizabeth Augusta Slipp.	Florence Gertrude Hall.
Nettie Rayworth.	Edgar Alonzo Howe.

## CLASS OF 1895.

Lulu Barbrick.	Clara E. Pinney.
Flora E. Brawn.	Lila M. Colburn.
Elizabeth S. Thompson.	Helen E. McLane.
Hattie E. Bragdon.	Kathleen Kersey.
Jennie Quinn.	Jennie L. Johnstone.

## CLASS OF 1896.

Gertrude E. Cameron.	Nellie Chapman.
Abbie Larobee.	

## CLASS OF 1897.

Carolyn Bryant.	Anna B. Innis.
Kate Rauch.	Ida C. Noble.
Erena Yale.	Margaret Alexander.
Mary F. Maher.	Florence R. Tobin.
Frances Cummings.	Fred L. Howe.

## CLASS OF 1898.

Sarah S. Bugbee.	Lilla B. Brown.
Elsie M. Seierup.	Elizabeth H. Ham.
Carol L. Conant.	Martha E. Jackman.
Bessie Nesbitt.	Minnie F. Praught.
Emma M. Stearns.	Annie F. McDonald.
Myra Haynes.	Hattie Lee Evans.
John L. Welsh.	

## CLASS OF 1899.

Harriet Mabel Cruise.	Eliza Roberts.
Emma Marie Griep.	Margaret H. Schurman.
Mabel Goodwin Harvey.	Belinda H. Tappan.

## CLASS OF 1900.

Anna L. Butterfield.	Matilda E. Howard.
Rosie Cockell.	Ida M. Hunt.
Ethelyn Dutcher.	Harriet J. Little.
Mary E. Fish.	Lorena E. Rogers.
Eunice A. Fisk.	Alice A. Tweedie.

Anna B. Tweedie.

## CLASS OF 1901.

Jennie May Cockell.	Elizabeth Thresa Murphy.
Ada Avery Evans.	Anna Reed Wilson.
Annie Greenfield Wood.	

## CLASS OF 1902.

Amelia Jane Bullock.	Addie Anna Taylor.
Anna Day.	Annie Langille.
Veloura Belle Johnson.	Hilda Olivia Lawson.
Jennie Ellen Mather.	Tena Anna Urquhart.
Melissa Helen Pressey.	Ada Jane VanVranken.

## CLASS OF 1903.

Isabel Anderson Allan.	Clara M. Glidden.
Sarah Elizabeth Babcock.	Laura A. Mills.
Bertha Mabel Benson.	Bertha A. Osier.
Evangeline G. Benson.	Mary D. Patterson.
Minnie M. Bigney.	Edna E. Pugsley.
Ada Mae Brown.	Susie E. Webber.

## CLASS OF 1904.

Elsie E. Cater.	Celia A. Perrin.
Mary D. Patterson.	Bernadette L. Smith.

## CLASS OF 1905.

Jeanette Campbell Dickson, Sonora, Guysboro Co., N. S.  
Helen Marie Garde, Lowell, Mass.  
Myra Ordway Hemphill, Concord, N. H.  
Adelaide Estano Hubley, Halifax, N. S.  
Margaret Ursula Kelly, Lowell, Mass.  
Lillian Pearl Rollins, Wentworth, N. H.  
Olive Gray Eaton, Chelmsford Center, Mass.  
Mabel Olive Hall, Concord, N. H.  
Mabel Lorena Hersom, Lowell, Mass.  
Sarah Ann Hunter, Charlestown, Mass.  
Mary Theresa Morris, North Billerica, Mass.  
Blanche Pauline Stevens, Sackville, N. B.

## CLASS OF 1906.

Myrtie Morse Bingham, Bristol, N. H.  
Mary Elizabeth Cummings, Guysboro, N. S.  
Christianna Reay, Alna, Me.  
Kittie Noreena Carr Todd, Elkins, N. H.  
Ella Mina Lupien Blodgett, Newbury, Vt.  
Annie Elizabeth Miller, Hubbardston, Mass.  
Ida Janett Stewart, Proctorsville, Vt.  
Sara Von Helena Wheaton, Melrose, Mass.

## CLASS OF 1907.

Hilda S. Setterland, Dorchester, Mass.  
Mary F. Shaloo, Billerica, Mass.  
Mary J. Hocks, Manchester, N. H.  
Margaret O'Hara, Billerica, Mass.  
Daphne W. Perkins, Moore's Corner, Mass.  
Mary B. Perkins, West Concord, N. H.  
Violet H. Spencer, Parker's Ridge, N. B.  
Anne Cheney, Ashland, N. H.

## CLASS OF 1908.

Clara Belle Locklin, Utica, N. Y.  
Sarah Dunfield Emerson, Effingham, N. H.  
Margaret Jean Leslie, Apple River, N. S.  
Blanche Adelaide Hemeon, Halifax, N. S.

## CLASS OF 1909.

Georgianna Cambell, Newport, Vt.  
Mary Ellen Cunningham, Concord, N. H.  
Mary Elizabeth Dalton, Canning, N. S.  
Margaret Richardson Harris, Southboro, Mass.  
Yvonne Adeline Faforest, Manchester, N. H.  
Caroline Vianna Lane, Stratham, N. H.  
Mary Monica Pollock, Lebanon, N. H.  
Elizabeth Oxley Reade, Bayside, N. B.  
Catherine Agnes Ryan, Penacook, N. H.  
Martha Elsie Schofield, Orleans, Mass.  
Ellen Calvert Spiers, Montreal, P. Q.  
Anna Welles, Guysborough, N. S.  
Grace Lillian Woods, Nashua, N. H.

## CLASS OF 1910.

Christina Brown, Paisley, Scotland.  
Hannah Marie Callahan, Watertown, Mass.  
Martha Maria George, Castle Bar, Quebec.  
Clara Edna Howe, Bedford, Mass.



Jane Grant McCabe, Leominster, Mass.  
Teresa Rosalie McKenna, Charlestown, Mass.  
Catherine Evelyn Murray, Lowell, Mass.  
Bertha May Perry, Leominster, Mass.  
Nora Purcell, Roxbury, Mass.  
Laura Hester Reed, Oak Bay, N. B.  
Helen Jane Sabre, Lowell, Mass.  
Ada Grace Young, Milltown, N. B.

## ADDRESS

---

### GRADUATING EXERCISES OF THE TRAINING SCHOOL FOR NURSES, OCTOBER 5, 1910.

---

BY DR. GEORGE T. TUTTLE, SUPERINTENDENT OF MCLEAN  
HOSPITAL, WAVERLY, MASS.

All great reforms, all advances in civilization, are of slow growth and are attained by a process of evolution. The public mind is prepared for them little by little and they receive contributions from many different sources. The reform in nursing, the growth of our present system of educating nurses for hospitals and for the sick in their homes, presents no exception to the rule, although there have been times of more rapid advance due to circumstances and the philanthropic efforts of good men and women. Among the many who have made marked contribution to the cause none are so prominent in our thoughts as Theodor Fliedner and Florence Nightingale.

Theodor Fliedner was the pastor of a Lutheran church in the small village of Kaiserswerth on the Rhine. In his efforts to aid his financially afflicted people he went to Holland and England in 1822, where he visited schools, almshouses, prisons, and hospitals. In Holland he saw the work of the deaconesses of the church among the sick and poor, in what we now call district nursing. In 1836 he and his wife established a school for the training of deaconesses in his own parish. Its work was broader than that of nursing, besides which it included relief of the poor, care of children, and rescue of fallen women. The order of deaconesses was a free religious association. Its department of instruction

in nursing gave a five years' course during which the pupils received a little pocket money but no pay. The hours were from 5 A. M. to 9 P. M., with short periods for meals, instruction, and prayers. The teaching was by class-work, lectures, and a rotation of service in the kitchen, laundry, and garden as well as in the care of the sick. The Kaiserswerth School has established branches throughout Germany and in other countries. Its graduates have under their care many hospitals, orphan homes, infant schools, institutions for the blind, deaf, and dumb, and others of similar character for the relief and care of the afflicted, and its influence on nursing reform has been great throughout the civilized world. This influence reached the United States through England.

In 1840 Mrs. Fry, who had been doing philanthropic work in the English prisons, went to Kaiserswerth to learn the methods there employed, and later established in London "The Order of the Nursing Sisters," who lived in a home and visited and worked in Guy's Hospital, where they received their training. In 1845 the church of England first established a sisterhood called the "Park Village Community." In 1848 the community of St. John's Hospital was founded which was called "The Training Institution for Nurses in Hospitals, Families, and for the Poor." Thus far the efforts to improve the character and quality of nursing had originated within the church, and women who entered the service did so from religious motives.

Miss Florence Nightingale, whose recent death reminds us anew of the debt of gratitude which the world owes to her, became interested in philanthropy in early life, and, with her friends, Mr. and Mrs. Sidney Herbert, visited many hospitals, schools and reformatories in England and on the continent. She decided to become a nurse, and went to Kaiserswerth for three months in 1849 and again for a few weeks in 1850. Following this she spent some time in a sisterhood in Paris, where she learned surgical nursing. With the experience thus gained she established a home for sick governesses in London, of which she herself was the super-

intendent. The Crimean war broke out in March, 1854, and the London Press soon told of the insufficient preparations for the care of the wounded and of their sad condition, with appeals for nurses. Thus far women nurses had not been employed in the English army, but in response to a strong public demand Miss Nightingale offered her services and went to the field with thirty-eight women to take charge of the nursing. The authorities did not want her and her nurses, and she labored not only under most difficult and distressing conditions, which could not at once be helped, but with the ill will and opposition of those who should have given her every possible assistance. Notwithstanding such obstacles, her work was brilliantly successful and merited the grateful appreciation of the English nation which it received. A fund of \$200,000 was raised by popular subscription to establish in her memory a training school for nurses. She returned to England in 1856 in poor health and was not able personally to superintend the school, but it was founded under her advice and direction. It was opened in St. Thomas' Hospital, June 15, 1860, and was the first school outside the church which was ever established for the systematic instruction of nurses.

We, who take so much as a matter of course good hospital housekeeping and good nursing, can scarcely realize the condition of some hospitals previous to the advent of training school. The English hospital nurse of those days was of a low order, often intemperate and immoral, and the stigma attached to the work of a nurse was such that good women did not care to enter the service. The nurse was paid a certain sum of money each week with which she bought the raw material and cooked her own food, or she was given a less sum with so much bread, milk, and beer daily. Some of the women whom Miss Nightingale took with her were of this order of nurse and she was obliged to send several home because of intemperance or other misconduct.

Five years after the Crimean war came our own war of the Rebellion. Through the influence of the Woman's Relief

Association of New York the secretary of war appointed a sanitary commission as the official representative of the government to take charge of hospitals and everything pertaining to the work of the nursing and care of the sick and wounded soldiers. During the war some two thousand women were employed in the nursing and hospital service, under the supervision of Miss Dorothea Dix, who already had made her reputation in the reforms which she had brought about in the care and treatment of the insane. The employment of women as nurses in our army was the direct result of Miss Nightingale's work in Crimea. From experience gained in the war by a large body of surgeons there was a decided advance in knowledge of hospital construction, sanitation, and the practice of surgery. The necessity for good nursing was appreciated as never before, and in 1869 a committee of the American Medical Association at their annual meeting presented a report recommending that every large and well-organized hospital should have a school for the training of nurses for itself and for private practice.

Before speaking of the establishment of such schools mention should be made of some earlier attempts in this country to improve the quality of nursing. The first was that of Dr. Valentine Seaman in the New York Hospital in 1798. Perhaps the inscription under his portrait claims too much; it reads: "In 1798 he organized in the New York Hospital the first regular training school for nurses from which other schools have since been established, and extended their blessings throughout the community." I do not know what other schools were established or how long they survived, but they and Dr. Seaman's school died long ago. In 1839 benevolent women in Philadelphia organized the "Nurses' Society of Philadelphia" to educate and provide nurses for poor women during their confinement. Lectures were given, and both nurses and young medical men were taught together. After attending six cases each nurse was given a certificate and could do private work. In 1850 a home and school was

opened for them and applicants then became pupil nurses. They were taught cookery and some theoretical instruction was given by physicians. In 1897 its course of study was extended to one year. The instruction from the beginning has been in obstetrics.

The first school in the United States for the general training of nurses was that in the New England Hospital for Women and Children, which dates from 1872, though some desultory instruction had been given nurses for ten years previous to that time. The next school was in the Bellevue Hospital in New York, May 1, 1873, and in the fall of the same year the schools in the New Haven Hospital and in the Massachusetts General Hospital. The value and success of the movement were now practically demonstrated.

We are indebted to the Christian religion and the church for many things that are worth while in this world. There was a time when the church alone had the knowledge and the money to appreciate and promote science, literature, architecture, art,—in fact, everything that tends to the elevation and refinement of man. The monasteries of the church were our early hospitals. The holy women of the church were the nurses of the world, and, as we have seen, the more formal attempts at the instruction of women in the art of nursing at Kaiserswerth and in England were under the patronage of the church. The idea of receiving pay for one's labor was then thought to be "godless, sordid, and debasing," and the demonstration of the fact that a woman of education and refinement could not only be a nurse, but could do the work of a nurse as a means of earning an honorable livelihood dates from the time of the establishment of the Nightingale School in St. Thomas Hospital in 1860.

The employment of women as nurses in the armies of England and the United States met with considerable opposition from commanding officers, who were forced to yield by pressure of public opinion. The establishment of training schools in general hospitals also was made more difficult by the opposition of visiting physicians and surgeons, most of



whom preferred the old régime. They all were soon convinced of a great improvement in the nursing, but so far as I am aware no hospital prior to 1878 of its own initiative had established such a school. The Boston City Hospital School was established by Dr. Edward Cowles in that year.

The early schools were organized outside the hospitals, to which they furnished nursing, and were financed by private benevolence. But there is a limit to such benevolence. The schools themselves as a rule could not be self-supporting, for there is little demand for one that charges even a moderate fee for board and tuition. There is no money in the business of education; all the colleges and professional schools of which I know personally are always financially embarrassed and are calling for more money. Had we then continued to be dependent on charity for their instruction the supply of nurses would indeed be limited. There would be only a few schools and these in the large cities. But private enterprise having demonstrated the value of the work, it has been the privilege of the hospitals themselves to take it up and greatly extend it. Only the desire of hospitals to improve the nursing service for their patients and their willingness to enter the field of education have made possible for so many young men and women, with a fair preliminary education, a most honorable profession, which is for them the best career that the world affords. The service rendered by the nurse is one to which in my opinion no other bears a favorable comparison unless it be that of the teacher, and it offers a greater variety and higher remuneration than that. The course of instruction is better than that of a college, so far as its practical value is concerned, for the college graduate is fitted for nothing which will give self-support unless it be teaching, and really not for that until after additional instruction in a normal school.

The length of time given to study and practice has varied considerably. That of the Nightingale school was one year, during which there were study and instruction, followed by three years of service, making four years' time spent in the

hospital. The Bellevue school required two years of hospital service, instruction being given only the first year. The early schools in this country, except that of the New England Hospital, had a course of two years. As a rule instruction was given both years, but that of the second was merely a repetition of the first. With advance in medicine, additional methods of treatment, refinements in the art of nursing, instruction in certain special branches, and a preliminary course of study, two years was found to be insufficient, and it was extended to two and a half, three, or, in some instances, even to four years. There are few hospitals that contain within their own walls a sufficient variety of service to profitably occupy the nurse for more than two years. If, however, nurses are sent outside for special courses, and, particularly if a preliminary course of instruction is given, three years is perhaps not too long a time; although it should be said that of late some have thought that the curriculum was needlessly elaborate and included subjects which have little intimate relation to the business of nursing; and that our schools are in danger of becoming "institutes for the higher education of women along medical lines." No doubt a young woman of ordinary ability and a fair preliminary education could acquire all the knowledge and experience necessary to begin her work as a private nurse, even including the nursing of special forms of disease, in two years if everything could be subordinated to the nurse's instruction. But she is paying for her living and education by her labor, and there is work to be done over and over again which is not absolutely necessary for her education, except it may be in the way of discipline, but which is necessary for the proper care of the patients. She therefore must spend more time than is absolutely necessary to learn what she wishes to know.

There are specialties in nursing as in medicine. The one you have chosen is the most difficult and the most important of them all. The benefits of an educated nursing service had not extended to hospitals for the insane, and there was no formally organized school in such hospital until Dr. Cowles

established that of the McLean Hospital in 1882. Prior to this time there had been spasmodic attempts at the instruction of attendants, like that of Dr. Browne in the Chrichton Institution in England, who in 1854, the year that Miss Nightingale went to the Crimea, gave a course of thirty weekly lectures to his "officers, the male and female attendants, and some of the patients who belonged to the medical profession." In '81 Dr. Clark undertook to devise "an organized scheme of special training" in the Glasgow District Asylum in Scotland. In '83 teaching was begun in the Buffalo State Hospital, which led to a more complete school system in 1885. Other attempts were made in this country, the purpose being to educate attendants so that they could be more useful to the hospital; but as the novelty wore off interest waned and such efforts were of little value and were not permanent. It remained for Dr. Cowles to demonstrate that such nurses should and could be so trained that they would be qualified to practice in general nursing besides being competent to render skilled service in the care of nervous and mental diseases.

In the last generation people have learned to use hospitals as never before, the number has increased rapidly, and most of them, even the smallest, have established training schools. In 1880 there were fifteen such schools in the United States, with 323 pupils and 157 graduates; in 1909, 1,096 schools with 29,320 pupils, and in this year 7,017 graduates. Notwithstanding this large increase, the supply is not yet too large for the demand, which seems to be stimulated by the very increase of the supply. And then too all graduates do not continue in the profession. Something over a quarter marry and carry into domestic life a training and experience the value of which for a wife and mother and for usefulness in the community it would be difficult to overestimate. A few become physicians. Others retire because of ill health or because they have reached the limit of their professional life. The length of a nurse's service has been said to be only ten or twelve years. This, in my opinion, is too low an esti-

mate, though it no doubt depends somewhat on the strenuousness of her life. Some of us can remember the prediction made a generation ago that as the number of trained nurses increased, a time would be reached when the supply would be so great that their compensation would be reduced till all, even people in very moderate circumstances, could employ them, and every town would have its trained nurses as it now has one or more physicians. The usual pay of the nurse was then \$15 a week. We have seen it increase to \$21 and then to \$25 and \$30. There appears to be no surplus of good nurses.

This question of less expensive, but still good, nursing has received considerable attention, and in a school at Albany a six months' course of instruction is given to women to fit them to serve as so called domestic nurses or attendants, who are expected to render fairly satisfactory service for perhaps \$12 or \$15 a week. But this matter in the long run is regulated by the law of supply and demand, and the best of these so trained nurses soon command a higher price. The problem is not yet solved. The poor, if unable to employ a pupil nurse from some training school, must still depend on the nursing skill of relatives or friends, supplemented perhaps by aid of the visiting nurse, or must go to a hospital. We all do something for charity, and in long-continued cases that are not especially difficult one might make some concession, but you are working for a living, and, as a rule, people will value your services somewhat according to the price. I think you should obtain what is paid others for similar service. Nursing is now secularized and nurses are expected to support themselves, and sometimes others as well, and also to make provision for advancing years. I advise you to save money for a rainy day and old age. Put it in a good savings bank, or better still a coöperative bank, which will oblige you to save a fixed sum every month. If you don't know what banks are good ask some business man, in whom you have confidence, but don't give your money to any individual to keep or invest for you, no matter what his reputation, and don't loan it to a relative.

In time you must decide whether you will work in a hospital as head nurse, superintendent or assistant superintendent of nurses, supervisor or as a superintendent of one of the smaller cottage hospitals that are scattered over the country, or whether you will enter private practice. Your experience thus far has been of hospital work and I venture to contrast the two fields. In the hospital the pay is regular and sure. There are no living expenses. One has a more even life with regular hours for work, recreation and sleep, a vacation with salary, care of sick, less responsibility and less anxiety. In private practice more money is received, except for the higher positions in hospital work, but there are expenses for room, and, when not at work, for board and laundry. The hours for work, recreation, and sleep are often irregular,—certainly so in emergencies. The responsibility and anxiety are greater. Personal preference settles the question. Some like the rush, frequent change, and activity of private work and are able to assume responsibilities without undue anxiety, but I am inclined to think that most nurses would be able to work longer and would live longer under the more even conditions of hospital work, and that at the end of a working life the accumulated savings would be as large. But all cannot and do not want to stay in the hospital, and most of you will nurse the sick in their homes.

You are about to join a large and increasingly influential body of women who have formed various local as well as state and national organizations and who publish a journal of nursing. I would take the journal and would join one of the associations even if not able to attend its meetings very frequently. There is inspiration and increase in knowledge and efficiency from intimate association and exchange of ideas with others engaged in the same work. It certainly is so with physicians. The doctor who does not read current medical literature and who does not attend the meetings of a good medical society is in danger of falling into a monotonous routine of practice from which he will never emerge.

Most states require of physicians who are allowed to prac-



tice within their borders a certain standard of professional attainment which is prescribed by law and enforced by a board of registration. Of recent years there has been a strong movement for the state registration of nurses and laws to this end have been enacted by many states. With physicians it is compulsory. With nurses it thus far is voluntary. The nurse can practice her profession without registration, but she cannot style herself a registered nurse. To my mind it presents two advantages to the public:

It designates a body of young men and women as capable nurses.

It tends to the maintenance of a high standard of nursing education, for no school would want its graduates discredited by failure to pass the necessary examinations.

I therefore favor state registration, and I advise you all to avail yourselves of its privileges.

You are looking forward to success in your work. May I be allowed to say that with fair professional attainments the qualities which will contribute to this are largely personal. Prominent among them are cheerfulness, sympathy, and tactfulness. For most people cheerfulness presupposes health, therefore take time for rest and recreation, which the attending physician should see that you have. Cultivate the habit of looking on the bright side of life.

In these days we hear much about treatment by suggestion, which is the real basis, though not always recognized, of the success of many systems of treatment that have flourished in the past and of many of the fads and isms of today. Physicians have used this for years, though not so formally as now, and there is no doubt of its value. While a nurse is not expected to make a psycho-analysis and apply suggestion as a therapeutic measure, she can favorably influence the course of the patient's sickness by her cheerful attitude and her invariable hopefulness. She cannot change the facts, but a situation must indeed be bad which does not contain some favorable element which can discreetly be made prominent. Some people die for want of courage to keep up the fight.



If nothing hopeful can be found there still is room for sympathy. I need not dwell on this. If you have not a kindly nature which prompts you to do something for the relief of others you are seriously handicapped in the race, for it is something that cannot be successfully simulated. Sympathy is best manifested not by sitting down and weeping with the afflicted or by dwelling on the cause of grief or distress, but by doing something to relieve it.

No doubt you often have been admonished, in the care of your patients, be tactful. Tact literally means touch, "mental touch," if you like, "nice perception or discernment"; "ready power of appreciating and doing what is required by circumstances"; "a fine sense of how to avoid giving offense." It implies a kindly feeling, sympathy, an ability to put one's self in another's place so as to know what it would be acceptable to do or say. There is of course a danger that attempts to please may lead to deceit, therefore tact should be exercised with strict honesty. It is thought by some to be innate, and certain elements are peculiar to the individual, particularly the sensitive, impressionable temperament; but other elements such as knowledge and judgment are matters of education and experience. A certain degree of tact then can be acquired by everyone. If you have done your hospital work well, and, especially, if you have been the private nurse of insane or nervous invalids and have not developed tactfulness from hard experiences, you must indeed be by nature deficient in its elements. There is a field for its exercise in private work, not only in your relations with your patient, but also with other members of the family and the servants. The nurse should remember that she is a guest in the house and should so conduct herself that all will be sorry when she goes.

A young woman whose early life was that of an elder sister, who had learned self-control and other good qualities in the management of the younger members of a large family, to whom she gave a mother's care, became a nurse. She had the qualities I have mentioned in a high degree and

was most successful. At the end of a long and extremely difficult case of mental illness, for which she was well paid, she was presented in addition with a check for one thousand dollars in token of appreciation of her services. Shortly afterward by another grateful family she was sent abroad for a three months' vacation. You may not all receive the large checks and the foreign trips, but you can merit and will receive grateful appreciation for faithful service. I wish you all a long and successful career.

## SERVICE MANUAL.

---

A strict observance of the following rules is the established condition of all contracts for service with the New Hampshire State Hospital, and any applicant for a position not willing to observe them strictly will do better to seek employment elsewhere.

1. Any employee wishing to leave the premises to go into the city or elsewhere must apply at the office, that such absence may be understood; and all must be at the hospital at ten o'clock in the evening, unless away later by permission.

2. It is expected that all persons employed will consider that, on the condition of their respective contracts, they have engaged their time and best services to the hospital; that it is inconsistent with their duties to hold any political office; that they are under obligations to do every duty assigned them, promptly and faithfully; that they will feel personally interested in the good care, safety, and welfare of the patients, and that they will give their personal influence in support of good order and the established regulations of the institution. To this end it is most desirable that all should cultivate quiet, kind, and dignified manners and correct habits in all things, considering always that this is no less for the interest of the employee than for that of the employer.

3. Those proposing to discontinue their services will give at least thirty days' notice, that time may be given to supply their places.

4. That the house may be quiet, it is expected that all will be in their own rooms after ten o'clock in the evening.

at which time the house is closed for the night. After this time the quiet of the house must not be disturbed by passing and conversation. All must bear in mind that the repose of the patients is a thing of prime importance. All having duties must rise at the morning bell and proceed to the performance of the same.

5. No light must be carried about the building except in a lantern and the greatest care must be taken in the use of matches, that none be left exposed. A little carelessness in this thing might be followed with the most serious consequences. No smoking will be allowed in the hospital buildings, except in the smoking room provided for that purpose.

6. No one will invite visitors to stop in the house without permission to do so; but on application all reasonable privileges will be granted.

7. No one shall employ a patient to do private work for himself or herself without the consent of the superintendent, assistant superintendent, or other officer authorized to give such permission; and no one is allowed to trade or make bargains with patients.

8. Provision is made to afford each person employed a vacation of two weeks in the year, during which time the duties of the position will be done by a substitute; but the superintendent does not guarantee to retain the place of anyone for a longer term of absence. On leaving for a vacation, or permanently, everyone will deliver his or her keys at the office.

9. Whenever patients are encouraged to engage in any kind of labor, it is with a view to their own benefit; and hence no one will be taken from the halls for that purpose unless some order to that effect has been given in the case.

10. The person taking patients to labor will be held strictly responsible for their safety, kind care, and safe return to their respective halls.

11. All farmers or others to whom patients are intrusted for labor will remember that they are not to be treated as

servants; they will avoid all appearance of commanding, and will exercise the greatest care that no willing one shall be made a drudge or work too long. It will be treated as a grave offense if any employee shall take advantage of the willingness or mental weakness of any patient to impose on such one the harder or more unpleasant parts of the work on which they are employed. The head farmer is required to see that this rule is obeyed in spirit and letter, and report promptly to the superintendent any violation of the same. As occupation is a thing of the greatest value to most patients, every employee is required to do all in his or her power to interest them in it in some form and make it attractive.

As far as practicable, provision will be made to give each employee opportunity to be absent from duty for church services on Sunday a due proportion of the time; and any whose ordinary labor is wholly suspended on Sunday are liable to be called on to relieve others whose duties continue a portion of the time, and such must hold themselves in readiness to be so called on. It is expected that all employees, whose duties do not interfere, will be present at the regular Sunday service in the chapel.

#### STEWARD.

The steward will have the general oversight of the building, farm, stock, and premises. It will be his duty to attend to ordinary business transactions and see that hospital property in every department is saved, kept in its proper place, protected from harm or waste and properly used. He will see that everything about the premises is kept in good order, that the grounds near the house are kept clean, free from waste and rubbish, and will extend the same supervision to the basement and attics, and see that the person to whom it is assigned to care for these spaces discharges his duty faithfully. He will see that all animals are properly taken care of, and that carriages, tools, and implements are kept in repair and stored in their places when not

in use; and, generally, he will be responsible to the superintendent for the good condition of property and premises, and must properly notify him of anything adverse to the welfare of the hospital which comes to his knowledge. He will attend to procuring ordinary supplies for subsistence, except so far as otherwise provided for by the superintendent, and see that such goods are delivered and stored in their proper places. He will see that the house is closed and the doors locked at the appointed hour at night, and hold himself ready to discharge any special duty required by the superintendent.

#### CLERK.

It will be the duty of the clerk to keep the books and accounts in a neat and accurate manner, take systematic care of all papers connected therewith and perform any special clerical work required by the superintendent.

#### HOUSEKEEPER.

SECTION 1. The housekeeper will have the general management of the internal domestic affairs. The labor in the kitchen, laundry, and sewing department will be done under her direction; and those employed in these departments will hold themselves subject to her orders in the discharge of their duties. She will attend to the good condition of all apartments connected with the general housekeeping, will see that they are properly furnished and kept in good order. She will see that all the work in her department is done in accordance with the general instructions of the superintendent.

SECT. 2. She will have the care of all goods and material used in her department and will see that they are saved and economically used; all bedding and articles manufactured for housekeeping purposes will be under her care, and she must see that they are not wasted or given out needlessly. She will have the care of the making of any clothing furnished to female patients and will be required to keep an accurate account of the cost of such clothing or other



articles furnished to anyone. The cost of any articles furnished for patients must be returned by her to the supervisor, to be entered in the accounts of such patients.

SECT. 3. It is the duty of the housekeeper to report to the superintendent any instance of misconduct, failure in the proper discharge of duty, or violation of the established regulations occurring in her department, and not promptly rectified by the delinquent. It will also be her duty to report to the person who keeps the time-book the times of commencing and leaving duty of all employed in her department.

#### SUPERVISORS.

SECTION 1. The supervisors in their respective departments will have the general oversight of the halls and the patients; and the prudence and tact with which their duties are performed will be an important factor in the condition of the house. It is expected that they will see that the rules of the house relating to the patients are observed in every particular; that all patients are treated with uniform respect and kindness; and it is their imperative duty to report immediately to the superintendent or assistant superintendent any instance of neglect, incivility or ill usage of a patient, or any violation of the established rules.

SECT. 2. They will see that all medicines prescribed are faithfully and in a proper manner administered and that all directions of the medical officers are strictly obeyed.

SECT. 3. They will be expected to pass as much time in the halls as the proper discharge of other duties will allow, will instruct new attendants in their duties, and as much as possible assist in efforts to interest and employ the patients.

SECT. 4. The supervisors must see that the dining-rooms are furnished with the necessary utensils, that the attendants take proper care of the dining-rooms, that the cupboards are sweet and in order, the tables neatly set and the meals properly served.

SECT. 5. They will have the general charge of the cloth-

ing of the patients and an oversight of the beds and bedding of the halls. The attendants must report to them any deficiency in either which may exist, and it is their duty to see that such wants are supplied.

SECT. 6. On the admission of patients, their clothing will be taken in charge by the supervisors, entered in the book provided for the purpose and each article plainly marked. All articles afterwards furnished or received will be cared for in the same manner.

The clothing of patients leaving must be compared with the record, neatly packed, and delivered at the office by the appropriate supervisor.

Any knives, razors or other dangerous articles in possession of a patient on admission must be brought to the office for safe keeping and record.

SECT. 7. They will pay special attention to the sick, report promptly at the office any change of symptoms, see that they have proper attention and that any special diet prescribed is delicately prepared and served.

SECT. 8. After passing through the halls and learning the condition of the patients early in the morning, the supervisors will very briefly report to the physicians any sickness or other fact demanding attention before their morning visits.

SECT. 9. Before the Sunday chapel service and other occasions of public gathering, the supervisors will see that the patients are properly dressed for the occasion and accompanied to the chapel by their attendants.

SECT. 10. The supervisors will report to the clerk the times of commencing and leaving off work on the part of the attendants employed in their respective departments.

SECT. 11. In general, the supervisors are expected to hold themselves in readiness to carry into practical effect the instructions of the superintendent and to use all their personal influence in support of the spirit and design of these regulations.

## ATTENDANTS.

A strict observance of the following rules is the established condition of all contracts for service in the wards of the New Hampshire State Hospital. It is expected that any applicant for the position of attendant who is unwilling to observe them strictly will do better to seek employment elsewhere. Having accepted such a position, any violation of them will be considered a breach of contract and treated according to the nature of the offense.

1. Any attendant wishing to absent himself from the premises after ten o'clock in the evening will leave word to that effect at the office, that such absence may be understood.

2. That the house may be quiet, it is expected that all will be at their own rooms after ten o'clock in the evening, after which hour the house is closed for the night. After this time the quiet of the house must not be disturbed by conversation or passing to and fro. It is expected that all lights will be extinguished at that hour; and it is the duty of the night watch to extinguish any light burning unnecessarily during the night as well as to report the same at the office. It is expected that any employee on leaving his room during the evening shall extinguish the light.

3. No light shall be carried about the building except in a lantern. All employees will use, in the service of the institution, the safety matches provided by the management. Only one box at a time will be furnished. The old box must be returned before a new one will be issued. *Attendants must never give matches to patients.*

4. Smoking in any room or ward is strictly prohibited.

5. The use of liquor in any form is positively forbidden.

6. Any attendant wishing to leave the service honorably will be expected to give reasonable notice of his intention to leave, preferably from two to four weeks.

7. Attendants are not allowed to invite their friends, relatives or strangers into the wards without permission from one of the physicians. No one will invite visitors to stop

in the house without permission to do so; but on application all reasonable privileges will be granted.

8. Attendants will never compel patients to work, but all patients who desire to assist may be allowed to take part in the housework, but under no circumstances must an attendant delegate one patient to take personal care of another patient. Personal care of patients, including feeding, bathing, dressing, and undressing and the administration of medicines, must never be intrusted to other patients. Attendants will never allow other employees to take patients out of their ward, either for work or any other purpose, unless special permission has been allowed by one of the physicians.

9. In wards P 1 and P 2 both attendants must be present at meal time and retiring time, unless one has special permission from the superintendent to be absent. In ward P 3 both attendants must be present at meal time, but they may alternate evenings off duty from immediately after the attendants' supper until retiring time. In wards with two attendants, both shall not leave their ward at the same time, but they may alternate with each other in the following way: One may have one hour off duty from 11 A. M. until 12 M., the other may have one hour from 4 till 5 P. M. They may alternate with each other on Sunday from the time the morning dining-room work is completed until 3 P. M.

In wards with one attendant, the attendant will alternate hours off duty with the attendant in the adjoining ward from 11 A. M. until 12 M. and from 4 to 5 P. M., and on Sunday they may alternate with each other from the time the morning dining-room work is completed until 3 P. M. In wards with one attendant, the attendant may alternate evenings off duty with the attendant in the adjoining ward from immediately after the attendants' supper until retiring time. All attendants must be present at meal time on Sundays as well as week days.

10. *Treatment of Patients.* In all their intercourse with

patients, the attendants are required to treat them with respect and civility, to be kind and gentle in manner and avoid roughness of every kind. In the care of their patients sympathy, kindness, and tact should take the place of force and display of authority. But if interference with violent and excited patients becomes necessary, sufficient aid must always be procured from the attendants of neighboring wards to avoid personal injury to either patients or attendants. Such aid should be summoned before attempting to deal with the case in hand. Personal conflicts are always to be avoided, choking, kicking, or striking of patients by attendants is never allowed. Any violation of this rule will be considered a grave offense.

11. No patient shall be restrained or secluded except by order of the physician, save in an emergency, in which case it shall be at once reported to the office.

12. The peculiarities of patients must never be made a subject of sport or ridicule.

13. Attendants will abstain from the use of profane or vulgar language.

14. Attendants will bathe untidy patients as often as is necessary. And once every week each attendant will see that every patient in his ward has a warm bath and change of underwear, hose, and linen. The attendant must be personally present at the bathing of the patients; especially important is this in the case of the feeble, epileptic and suicidal. The attendant will see that the water of the bath has the proper temperature. Bathroom doors are always to be kept locked.

15. The attendants will always take care that the clothing worn by patients is adapted to the season and occasion. In case of sudden change from heat to cold they must make at once the needed change of clothing.

16. It is particularly expected of attendants to see that every patient is cleanly in person; that the hair and nails are attended to; that any rent in clothing is promptly mended; that the garments worn are kept buttoned; and



that any stains from carelessness in eating are promptly removed.

17. In suitable weather the attendants are required to take such patients in their ward as are able into the open air twice daily, either to ride or walk. Newly arrived patients, however, are not to be taken out of their ward until ordered by one of the physicians.

18. In case of sickness or an emergency at night, the attendant may be called by the night watch to render assistance. Such assistance must be cheerfully given.

19. At certain specified hours attendants will give to such patients as are designated by the physicians medicines that may have been prescribed. This duty must always be performed by the attendant. After giving the medicine, they should wash and return the glasses to the proper place.

20. The keys of the ward are to be kept strictly in the hands of the attendants; they must never be left carelessly about, nor intrusted to patients.

21. At meal times the attendants must serve the food to the patients, see that each is properly provided for, and personally prepare and feed those who are sick or unable to feed themselves. The patients must not be hurried through their meals. Knives and forks must be accounted for and never carried from the table by patients.

22. *Care of the Ward.* In the morning the attendants will rise at six o'clock. They will unlock the doors of patients' rooms that have been locked; see that the beds are aired, the night vessels removed, and, as soon as other duties will allow, they will remove all soiled clothing and see that the beds are made according to the prescribed method. Every room must be swept out every morning, as well as the ward and dining-room. Especial attention must be given to the waterclosets, urinals, and bathroom. Absolute cleanliness must prevail. The attendants will sweep and wash the stairways leading to their respective wards every morning.

23. The care of the storeroom is extremely important.



It is the duty of the attendant to keep each patients' clothing in its proper drawer, to transfer the same with the patient whenever he is moved to another ward by order of the physician or supervisor, and to see that every article of clothing is accounted for and corresponds with what has been furnished by the supervisor.

24. Once every week the attendant will make out a requisition for articles needed for ward use, properly accounting for those that are worn out or destroyed, and give the same to the supervisor.

25. The attendant must shave those patients designated by the physicians or supervisor. In shaving great care must be taken to have the razor in good order and to shave easily and neatly. No other patient should be present and the razor must be kept under lock and key.

26. Patients who attend chapel or entertainments, who go out to walk or ride, or receive visits from friends or relatives, must be properly dressed, their hair brushed, and their general appearance made as presentable as their mental condition will allow.

27. The hours of meals, of closing the wards at night, and of duty, will be regulated by Eastern standard time. Clocks, regulated hourly by the clock in the office, will be located in the wards at accessible points and it is expected that all attendants will use this time and no other, regulating their watches and clocks by these standard time clocks.

28. *Hours of Closing Wards.* Attendants in charge of wards 4, 7, P 1 and P 2 will close their wards at 7.30 o'clock P. M.

Attendants in charge of wards 5 and 8 will close their wards at 8 o'clock P. M.

Attendants in charge of wards 9 and P 3 will close their wards at 8.30 o'clock P. M.

Attendants in charge of ward 6 will close that ward at 9 o'clock P. M.

At the above-mentioned hours all lights in the wards indicated will be extinguished.

29. During hours of duty, attendants will remain on their own ward, not in their own room, but on the ward. Visiting from hall to hall during hours of duty, without special business, or going away to other parts of the premises out of one's field of service, is wholly improper and not allowed.

30. The attendant will hold himself in readiness to accompany the physician or superintendent when he makes his ward visit.

31. In taking patients out of doors the attendants must see that no one strays from the party, and so regulate the speed of walking, or the character of other exercise, as to suit, as well as may be, the average of persons present. Preference should be given to walks within the hospital grounds, but, when walks are taken into the city, it is not permitted to visit stores, hotels, railroad stations or other public places, except by permission previously obtained.

32. All damages done to buildings or property by patients must be reported to the supervisor by the attendants.

33. *Duties of Attendants in Case of Fire.* Attendants will observe the following rules in case of fire:

I. Communicate with the office at once, either by telephone or messenger, giving information as to location and extent of fire.

II. Unlock at once every room door and get every patient who may be restrained or secluded out on the ward, no matter what their mental condition may be.

III. If the fire is in any ward, the attendant on duty will immediately uncoil the hose at the nearest house hydrant and turn on water. For this reason it is expected that every attendant will familiarize himself with the location of the various hydrants. In wards 4, 5, and 6 the hydrants are located on the stairways leading from office to those wards. In wards 7, 8, and 9 the hydrants are located in the west end of the ward in the closet marked "Hose Closet." In the Peaslee building the hydrants are located on the stairway leading from the wards of that building to

the basement. On each of these hydrants there is hose attached sufficient to extend to the next line of hose. The water can be turned on by opening valve, which turns towards the right. Be sure and uncoil hose and get out all knots or twists before turning on water.

IV. If the fire is in any other part of the building, the attendants will remain on their own wards, first getting all of their patients out of the rooms. They will wait for further orders.

V. If ordered, or if necessary, they will move the patients out of the ward through the exit that is most remote from the fire. In moving patients at such a time it is imperative that there should be as little confusion and excitement as possible. The attendant should have his patients file out in line and be particularly careful to avoid confusion on the stairways.

VI. After patients are removed from the ward, the attendant must remain with them, keeping them together, and await orders from supervisor or physician.

#### EXTRACT FROM THE REVISED LAWS OF THE STATE OF NEW HAMPSHIRE.

##### Chapter 280.

SECT. 10. "If any person shall aid in any manner in the escape of a prisoner committed, before or after conviction, to any place of confinement for any criminal offense not capital, he shall be liable to the same punishment to which such prisoner was or would have been liable, or to imprisonment not exceeding one year and fine not exceeding two thousand dollars."

SECT. 34. Hospital keys are not to leave the premises but are to be left in the office at the time of registering, and only with the one in charge of the office.

SECT. 35. Each bunch of keys is numbered and the attendant is held responsible for each key composing that bunch. When changing from one ward to another the keys at the office must correspond with the ward.

## COOK.

Under the direction of the matron the cook will leave the supervision of the work in the kitchen, the care of utensils and of supplies of provisions within the kitchen premises.

The cook must see that the kitchen and all utensils are kept clean and in perfect order, that good order is preserved in the kitchen, and that each employee performs all duties assigned in a proper manner.

The cook shall see that all food is prepared as directed, is made palatable and inviting and sent to the halls hot. Special care must be taken in preparing diets for the sick, that they are nicely cooked and sent to the patients in acceptable form.

The cook shall report to the matron any instance of failure in duty or violation of the rules occurring in the department.

Persons employed elsewhere in the institution will not be allowed to loiter about the kitchen premises or bakery.

If any meat, butter or other articles of food of poor quality are furnished for use, the head cook must promptly report it to the steward or superintendent.

## BAKER.

The baker will see that the baking room, oven, and all utensils belonging to his department are kept scrupulously clean at all times, that the house is kept supplied with the various kinds of bread prescribed, and he must keep his stock of bread sufficiently in advance of the demand that it may not be eaten absolutely new. On the mornings designated, he will make warm rolls or biscuit in season for breakfast.

It is his duty to report at once to the superintendent or steward any defect he may discover in the quality of the flour or other material for food furnished to his department.

## PORTER.

The porter will have the whole charge of the food car and will keep it always clean and in good order; will, at the appointed times, take the prepared meals from the kitchen to the several dumb-waiters, and deliver them to the attendants, who shall be present at the call of the slide-bell to assist the porter in running up the dumb-waiter, if necessary, and remove the meals carefully to the dining-rooms. In this, care must be taken by all that the food and utensils are handled gently and that the meals reach the tables in good order. In like manner must the dishes and waste be received from the attendants by the porter, and by him be properly disposed of.

The porter will be responsible for keeping the basement and attics swept and everything in its place. It is also his duty to fill the underbeds for the female attendants, great care being taken that the sacks be not soiled in the process. He will also remove the discarded beds each morning to the place designated. At the appointed times the porter will attend to instructions of the superintendent. He will see that any object thrown from the windows during the night is removed promptly in the morning and will hold himself ready to perform any item of duty required by the superintendent.

## ENGINEER.

The engineer will be responsible for the good care of the boilers, engine, steam, and water pumps, and all parts of the machinery, which must be kept in repair and in good running order. He shall promptly attend to the repairs needed in steam or water apparatus or other repairs or alterations assigned to him. It will be his duty to see that the boilers are properly fired and the fuel used in the most economical and efficient manner. He will see that the radiators, air-chambers, and flues are properly adjusted for heat and ventilation, and that the amount of steam generated is wisely adapted to the state of the weather. It will be his duty in

summer to attend to all needed alterations and repairs in steam-heating apparatus, preparatory to the demands of winter.

He must at all times be so thoroughly familiar with the location and condition of all hydrants, hose or water cocks provided for the extinguishing of fire that he may put them in operation instantly, if needed. He will also be expected to hold himself in readiness to attend to any special duty required by the superintendent.

#### FARMER.

The head farmer will have the immediate supervision of the farm laborers, the laying out of the work and the direction of the care and use of the stock and farming utensils; and all farm laborers will look to him for specific directions as to their duties.

It is his duty to see that all farm fences are kept in repair, and that everything on the farm and about the farm buildings is kept in perfect order, that the stock is well cared for, that every farmer performs his duty well, and that all material is properly and economically used. He will report to the clerk the time of service of each person in his department and to the superintendent any fault or failure in duty on the part of any under his charge.



# SUCCESSION OF OFFICERS.

## TRUSTEES.

Appointed.	Name.	Residence.
1838 or 1839.	George W. Haven,	Portsmouth.
	Samuel E. Coues,	Portsmouth.
	John Conant,	Jaffrey.
	Amos Twitchell,	Keene.
	John H. Steele,	Peterborough.
	Josiah Quincy,	Rumney.
	David Abbot	Nashua.
	Joseph Low,	Concord.
	Isaac Hill,	Concord.
	Charles H. Atherton,	Amherst.
	Dixi Crosby,	Hanover.
	Charles H. Peaslee,	Concord.
1840. June 20.	Daniel Abbot,	Nashua.
June 20.	Amos Twitchell,	Keene.
June 20.	Ichabod Bartlett,	Portsmouth.
June 20.	John Conant,	Jaffrey.
June 20.	Joseph Low,	Concord.
June 20.	Charles H. Peaslee,	Concord.
June 20.	Ira St. Clair,	Deerfield.
June 20.	Charles A. Cheever,	Portsmouth.
June 20.	John P. Hale,	Dover.
June 20.	Charles J. Fox,	Nashville.
June 20.	Samuel Swazey,	Haverhill.
June 20.	John S. Wells,	Lancaster.
1841. June 15.	Enos Stevens,	Charlestown.
June 15.	George W. Kittredge,	Newmarket.
June 15.	Joseph Low, reappointed,	Concord.
1842. June 7.	Moses Norris, Jr., <i>vice</i> John S. Wells, resigned,	Pittsfield.
June 7.	John Conant,	Jaffrey.
June 7.	John H. Steele,	Peterborough.
June 7.	Samuel Swazey,	Haverhill.

	Appointed.	Name.	Residence.
1843.	June 19.	Moses Norris, Jr.,	Pittsfield.
	June 19.	Ira St. Clair, reappointed,	Deerfield.
	June 19.	Charles J. Fox, reappointed,	Nashville.
1844.	Nov. 20.	Samuel E. Coues,	Portsmouth.
	Nov. 20.	Franklin Pierce,	Concord.
	Nov. 20.	Chas. H. Peaslee, reappointed,	Concord.
	Nov. 20.	William Plumer, in place of J. H. Steele, resigned,	Londonderry.
1845.	June 30.	Abiel Walker, <i>vice</i> Joseph Low,	Concord.
	June 30.	A. McFarland, <i>vice</i> G. W. Kit- tredge,	Meredith.
	June 30.	Timothy Hall, <i>vice</i> Enos Stev- ens,	Keene.
	June 30.	Luke Woodbury, <i>vice</i> C. J. Fox,	Antrim.
	June 30.	William Plumer, Jr., <i>vice</i> S. E. Coues,	Epping.
	Dec. 23.	James Farrington, <i>vice</i> A. Mc- Farland,	Rochester.
1846.	July 10.	Nathaniel S. Berry,	Hebron.
	July 10.	George B. Upham,	Claremont.
	July 10.	William Plumer,	Londonderry.
1847.	Aug. 9.	Joseph B. Walker, <i>vice</i> A. A. Walker,	Concord.
	Aug. 9.	Israel Hunt, Jr.,	Nashua.
	Aug. 9.	Warren Lovell,	Meredith.
	Aug. 9.	Thomas Shannon.	Moultonborough.
1848.	June 26.	William Plumer, reappointed,	Epping.
	June 26.	Franklin Pierce,	Concord.
	June 26.	R. Metcalf, <i>vice</i> G. B. Upham,	Newport.
	June 26.	Chas. H. Peaslee, reappointed,	Concord.
1849.	July 3.	Jos. B. Walker, reappointed,	Concord.
	July 3.	Joseph H. Smith,	Dover.
	July 3.	Amos A. Parker,	Fitzwilliam.
1850.	July 5.	Ralph Metcalf, reappointed,	Epping.
	July 5.	Isaac Ross, <i>vice</i> N. S. Berry,	Hanover.
	July 5.	David Pillsbury, <i>vice</i> William Plumer,	Chester.
1851.	July 4.	Charles Burroughs, <i>vice</i> T. Shannon,	Portsmouth.
	July 4.	Israel Hunt, reappointed,	Nashua.
	July 4.	Warren Lovell, reappointed,	Laconia.

	Appointed.	Name.	Residence.
1852.	June 19.	Franklin Pierce, reappointed,	Concord.
	June 19.	William Plumer, reappointed,	Epping.
	June 19.	Chas. H. Peaslee, reappointed,	Concord.
1853.	July 1.	Jos. B. Walker, reappointed,	Concord.
	July 1.	Joseph H. Smith, reappointed,	Dover.
	July 1.	Amos A. Parker, reappointed,	Fitzwilliam.
1854.	July 15.	Ralph Metcalf, reappointed,	Newport.
	July 15.	Samuel Herbert,	Rumney.
	July 15.	Enoch D. Yeaton,	Wakefield.
	Sept. 29.	J. A. Richardson, <i>vice</i> William Plumer,	Durham.
1855.	July 10.	Rufus Clement,	Concord.
	July 10.	Alvah Smith, <i>vice</i> Ralph Metcalf,	Lempster.
	July 10.	Chas. Burroughs, reappointed,	Portsmouth.
1856.	Feb. 23.	Timothy Haynes, <i>vice</i> R. Clement,	Concord.
	July 11.	John Preston,	New Ipswich.
	July 11.	Chas. H. Peaslee, reappointed,	Concord.
1857.	June 30.	George B. Twitchell,	Keene.
	June 30.	Jos. B. Walker, reappointed,	Concord.
	June 30.	John H. White,	Lancaster.
1858.	June 26.	Jeremiah F. Hall,	Wolfeboro.
	June 26.	Ralph Metcalf, reappointed,	Newport.
	June 26.	Samuel Herbert, reappointed,	Rumney.
	Sept. 28.	Edw. Wyman, <i>vice</i> R. Metcalf,	Newport.
1859.	June 27.	Chas. Burroughs, reappointed,	Portsmouth.
	June 28.	Timothy Haynes, reappointed,	Concord.
1860.	June 27.	Woodbury Melcher,	Gilford.
	June 27.	J. A. Richardson, reappointed,	Durham.
	June 27.	Chas. H. Peaslee, reappointed,	Concord.
	June 27.	John Preston, reappointed,	New Ipswich.
1861.	July 2.	George B. Twitchell, reappointed,	Keene.
	July 2.	Jos. B. Walker, reappointed,	Concord.
	July 2.	John H. White, reappointed,	Lancaster.
1862.	July 2.	John Conant, reappointed,	Jaffrey.
	July 2.	Isaac Spalding,	Nashua.
	July 2.	Moses Clark,	Landaff.
1863.	June 29.	Charles W. Flanders,	Concord.
	June 29.	Chas. Burroughs, reappointed,	Portsmouth.
	June 29.	Woodbury Melcher, reappointed,	Laconia.

	Appointed.	Name.	Residence.
1864.	July 7.	Chas. H. Peaslee, reappointed,	Concord.
	July 7.	John Preston, reappointed,	New Ipswich.
	July 7.	William G. Perry,	Exeter.
1865.	July 16.	George B. Twitchell, reappointed,	Keene.
	July 16.	Jos. B. Walker, reappointed,	Concord.
	July 16.	Denison R. Burnham,	Plymouth.
1866.	June 22.	Charles A. Tufts,	Dover.
	June 22.	John Conant, reappointed,	Jaffrey.
	June 22.	Isaac Spalding, reappointed,	Nashua.
	Oct. 23.	Isaac Adams, <i>vice</i> C. H. Peaslee,	Sandwich.
1867.	June 19.	Chas. Burroughs, reappointed,	Portsmouth.
	June 19.	Woodbury Melcher, reappointed,	Laconia.
	June 19.	Ebenezer S. Towle,	Concord.
1868.	April 13.	I. Goodwin, <i>vice</i> C. Burroughs,	Portsmouth.
	July 1.	Isaac Adams, reappointed,	Sandwich.
	July 1.	Waterman Smith,	Manchester.
	July 1.	Wm. G. Perry, reappointed,	Exeter.
	July 1.	Ebenezer S. Towle, reappointed,	Concord.
1869.	July 1.	Jos. B. Walker, reappointed,	Concord.
	July 1.	George B. Twitchell, reappointed,	Keene.
	July 1.	Denison R. Burnham, reappointed,	Plymouth.
1870.	Jan. 3.	John W. Sanborn, <i>vice</i> Isaac Adams,	Wakefield.
	July 8.	Isaac Spalding, reappointed,	Nashua.
	July 8.	Charles A. Tufts, reappointed,	Dover.
	July 8.	Dexter Richards,	Newport.
	Nov. 17.	Ellery A. Hibbard, <i>vice</i> W. Melcher,	Laconia.
1871.	Aug. 9.	E. A. Hibbard, reappointed,	Laconia.
	Aug. 9.	George W. Hayden,	Portsmouth.
	Aug. 9.	Henry Colony,	Keene.
1872.	July 16.	Waterman Smith, reappointed,	Manchester.
	July 16.	Wm. G. Perry, reappointed,	Exeter.
	July 16.	John W. Sanborn, reappointed,	Wakefield.
1873.	Oct. 23.	Jos. B. Walker, reappointed,	Concord.
	Oct. 23.	George B. Twitchell, reappointed,	Keene.

	Appointed.	Name.	Residence.
1873.	Oct. 23.	Josiah Minot,	Concord.
1874.	July 8.	Isaac Spalding, reappointed,	Nashua.
	July 8.	Charles A. Tufts, reappointed,	Dover.
	July 8.	Dexter Richards, reappointed,	Newport.
1875.	July 26.	E. A. Hibbard, reappointed,	Laconia.
	July 26.	Charles H. Bell,	Exeter.
	July 26.	Albert Smith,	Peterborough.
1876.	June 22.	David Gillis,	Nashua.
	July 20.	Wm. G. Perry, reappointed,	Exeter.
	July 20.	Waterman Smith, reappointed,	Manchester.
	July 20.	Joseph Burroughs,	Plymouth.
	Aug. 10.	John V. Barron, <i>vice</i> J. Minot,	Concord.
1877.	Oct. 17.	Jos. B. Walker, reappointed,	Concord.
	Oct. 17.	George B. Twitchell, reappointed,	Keene.
	Oct. 17.	John V. Barron, reappointed,	Concord.
1878.	May 2.	J. H. George, <i>vice</i> J. V. Barron,	Concord.
	May 2.	Carlton P. Frost, <i>vice</i> A. Smith,	Hanover.
	July 8.	Dexter Richards, reappointed,	Newport.
	July 8.	Charles A. Tufts, reappointed,	Dover.
	July 8.	David Gillis, reappointed,	Nashua.
1879.	July 30.	Ellery A. Hibbard, reappointed,	Laconia.
	July 30.	Jeremiah F. Hall,	Portsmouth.
	Aug. 14.	Carlton P. Frost, reappointed,	Hanover.
1880.	July 20.	Wm. G. Perry, reappointed,	Exeter.
	July 30.	Waterman Smith, reappointed,	Manchester.
	July 20.	Jos. Burroughs, reappointed,	Plymouth.
1881.	Oct. 12.	Jos. B. Walker, reappointed,	Concord.
	Oct. 12.	George B. Twitchell, reappointed,	Keene.
	Oct. 12.	John H. George, reappointed,	Concord.
1882.	June 21.	Emery J. Randall,	Somersworth.
	June 21.	Frederick E. Potter,	Portsmouth.
	Sept. 22.	Dexter Richards, reappointed,	Newport.
1883.	April 26.	William H. H. Mason, <i>vice</i> J. Burroughs,	Moultonborough.
	May 17.	E. Spalding, <i>vice</i> F. E. Potter,	Nashua.
	Aug. 28.	E. A. Hibbard, reappointed,	Laconia.
	Aug. 28.	Carlton P. Frost, reappointed,	Hanover.
	Aug. 28.	Jeremiah F. Hall, reappointed,	Portsmouth.

	Appointed.	Name.	Residence.
1884.	July 25.	Wm. G. Perry, reappointed,	Exeter.
	July 25.	Waterman Smith, reappointed,	Manchester.
	July 25.	William H. H. Mason, reappointed,	Moultonborough.
1885.	Oct. 14.	Jos. B. Walker, reappointed,	Concord.
	Oct. 14.	George B. Twitchell, reappointed,	Keene.
	Oct. 14.	John H. George, reappointed,	Concord.
1886.	Sept. 9.	Dexter Richards, reappointed,	Newport.
	July 8.	Emery J. Randall, reappointed,	Somersworth.
	July 8.	Edward Spalding, reappointed,	Nashua.
1887.	Sept. 7.	Ellery A. Hibbard, reappointed,	Laconia.
	Sept. 7.	Carlton P. Frost, reappointed,	Hanover.
	Sept. 7.	Jeremiah F. Hall, reappointed,	Portsmouth.
1888.	Mar. 6.	John E. Barry, <i>vice</i> John H. George, deceased,	Concord.
	Mar. 6.	Franklin D. Ayer, <i>vice</i> J. F. Hall, deceased,	Concord.
	July 24.	Wm. G. Perry, reappointed,	Exeter.
	July 24.	Waterman Smith, reappointed,	Manchester.
	July 24.	William H. H. Mason, reappointed,	Moultonborough.
1889.	Oct. 14.	Jos. B. Walker, reappointed,	Concord.
	Oct. 14.	George B. Twitchell, reappointed,	Keene.
	Oct. 14.	John E. Barry, reappointed,	Concord.
1890.	July 8.	Edward Spalding, reappointed,	Nashua.
	July 8.	Dexter Richards, reappointed,	Newport.
	July 8.	Morris Christie,	Antrim.
1891.	Sept. 14.	Ellery A. Hibbard, reappointed,	Laconia.
	Sept. 14.	Carlton P. Frost, reappointed,	Hanover.
	Sept. 14.	Franklin D. Ayer, reappointed,	Concord.
1892.	April 5.	Charles A. Tufts, <i>vice</i> W. H. H. Mason, deceased, reappointed,	Dover.
	July 28.	Wm. G. Perry, reappointed,	Exeter.
	Sept. 17.	John C. French, <i>vice</i> Waterman Smith, deceased,	Manchester.



	Appointed.	Name.	Residence.
1893.	Sept. 19.	Jos. B. Walker, reappointed,	Concord.
	Sept. 19.	John E. Barry, reappointed,	Concord.
	Sept. 19.	George B. Twitchell, reappointed,	Keene.
1894.	Aug. 1.	Morris Christie, reappointed,	Antrim.
	Aug. 1.	Dexter Richards, reappointed,	Newport.
	Aug. 1.	Edward Spalding, reappointed,	Nashua.
1895.	July 23.	William F. Thayer,	Concord.
	Oct. 22.	John A. Spalding,	Nashua.
	Oct. 22.	Ellery A. Hibbard, reappointed,	Laconia.
1896.	Aug. 11.	John C. French, reappointed,	Manchester.
	Aug. 11.	Wm. G. Perry, reappointed,	Exeter.
	Aug. 11.	E. O. Crossman,	Lisbon.
	Dec. 1.	James A. Edgerly,	Somersworth.
1897.	Sept. 3.	Jos. B. Walker, reappointed,	Concord.
	Sept. 3.	John E. Barry, reappointed,	Concord.
	Mar. 17.	Henry B. Quinby, <i>vice</i> Ellery A. Hibbard, deceased,	Lakeport.
	April 6.	George W. Pierce, <i>vice</i> George B. Twitchell, deceased,	Winchester.
	Oct. 7.	Geo. W. Pierce, reappointed,	Winchester.
1898.	Mar. 15.	C. H. Boynton, <i>vice</i> E. O. Crossman,	Lisbon.
	Aug. 1.	Dexter Richards, reappointed,	Newport.
	Aug. 1.	Morris Christie, reappointed,	Antrim.
	Aug. 1.	W. F. Thayer, reappointed,	Concord.
1899.	Feb. 21.	John McCrillis, <i>vice</i> Dexter Richards, deceased,	Newport.
	Oct. 22.	Henry B. Quinby, reappointed,	Lakeport.
	Oct. 22.	John A. Spalding, reappointed,	Nashua.
1900.	Jan. 11.	George B. Chandler, <i>vice</i> John C. French, deceased,	Manchester.
	July 1.	Jas. A. Edgerly, reappointed,	Somersworth.
	Aug. 11.	Geo. B. Chandler, reappointed,	Manchester.
	Aug. 11.	Wm. G. Perry, reappointed,	Exeter.
	Nov. 22.	John H. Mitchell, <i>vice</i> John E. Barry, deceased,	Concord.
1901.	Sept. 3.	Jos. B. Walker, reappointed,	Concord.
	Sept. 3.	John M. Mitchell, reappointed,	Concord.
	Oct. 7.	Geo. W. Pierce, reappointed,	Winchester.
1902.	Aug. 1.	John McCrillis, reappointed,	Newport.
	Aug. 1.	Wm. F. Thayer, reappointed,	Concord.
	Aug. 1.	Morris Christie, reappointed,	Antrim.

Appointed.		Name.	Residence.
1903.	Oct. 22.	John A. Spalding, reappointed,	Nashua.
	Oct. 22.	Henry B. Quinby, reappointed,	Lakeport.
	Oct. 22.	Edgar O. Crossman, <i>vice</i> Chas. H. Boynton, deceased,	Lisbon.
1904.	July 1.	Jas. A. Edgerly, reappointed,	Somersworth.
	Aug. 11.	Wm. G. Perry, reappointed,	Exeter.
	Aug. 11.	George Byron Chandler, reappointed,	Manchester.
1905.	July 28.	William P. Straw, <i>vice</i> George Byron Chandler, deceased,	Manchester.
	Sept. 3.	Jos. B. Walker, reappointed,	Concord.
	Sept. 3.	John M. Mitchell, reappointed,	Concord.
	Oct. 7.	Geo. W. Pierce, reappointed,	Winchester.
1906.	Aug. 1.	Morris Christie, M. D., reappointed,	Antrim.
	Aug. 1.	Wm. F. Thayer, reappointed,	Concord.
	Aug. 1.	John McCrillis, reappointed,	Newport.
1907.	Aug. 30.	George M. Kimball, <i>vice</i> Jos. B. Walker, resigned, appointed,	Concord.
	Oct. 22.	John A. Spalding, reappointed,	Nashua.
	Oct. 22.	Henry B. Quinby, reappointed,	Laconia.
	Oct. 22.	Edgar O. Crossman, M. D., reappointed,	Lisbon.
1908.	Feb. 4.	Roger G. Sullivan, <i>vice</i> John M. Mitchell, resigned, appointed,	Manchester.
	Aug. 11.	William Parker Straw, reappointed,	Manchester.
	Aug. 28.	Henry W. Anderson, <i>vice</i> William G. Perry, resigned, appointed,	Exeter.
	Aug. 28.	Benjamin W. Couch, <i>vice</i> Jas. A. Edgerly, deceased, appointed,	Concord.
	Jan. 13.	Geo. H. Saltmarsh, M. D., <i>vice</i> Henry B. Quinby, resigned, appointed,	Laconia.
	Sept. 3.	George M. Kimball, M. D., reappointed,	Concord.
1909.	Sept. 3.	Roger Sullivan, reappointed,	Manchester.
	Oct. 7.	Geo. W. Pierce, M. D., reappointed,	Winchester.

Appointed.	Name.	Residence.
1910. Aug. 1.	Wm. F. Thayer, reappointed,	Concord.
Aug. 1.	John McCrillis, reappointed,	Newport.
Aug. 1.	Fred S. Towle, M. D., <i>vice</i> Morris Christie, M. D., resigned, appointed,	Portsmouth.

## PRESIDENTS.

John H. Steele,	1839—1840
John Conant,	1840—1846
George B. Upham,	1847—1848
William Plumer,	1848—1855
Charles Burroughs,	1855—1868
Isaac Spalding,	1868—1875
George B. Twitchell,	1875—1897
Dexter Richards,	1897—1898
John A. Spalding,	1898—

## SECRETARIES.

Dixie Crosby,	1839—1841
Charles H. Peaslee,	1841—1848
Joseph B. Walker,	1848—1906
John M. Mitchell,	1906—1908
Benjamin W. Couch,	1908—

## TREASURERS.

James Thorn,	1839—1840
Joseph Low,	1840—1846
John Atwood	1846—1847
Andrew McFarland,	1847—1852
John E. Tyler,	1852—1857
Jesse P. Bancroft,	1857—1890
Charles P. Bancroft,	1890—

## SUPERINTENDENTS.

George Chandler,	1842—1845
Andrew McFarland,	1845—1852
John E. Tyler,	1852—1857
Jesse P. Bancroft,	1857—1882
Charles P. Bancroft,	1882—





# REPORT

OF THE

## STATE BOARD OF LICENSE COMMISSIONERS

OF THE

## STATE OF NEW HAMPSHIRE

FOR THE YEAR ENDING

AUGUST 31

1910

---

CONCORD, NEW HAMPSHIRE  
1910



*The Rumford Press*  
CONCORD, NEW HAMPSHIRE  
U. S. A.

## STATE OF NEW HAMPSHIRE.

---

*To His Excellency the Governor and the Honorable Council:*

The State Board of License Commissioners submit their report for the year ending August 31, 1910, as follows:

One application for a license was awaiting action at the time of the last report, and thirty-eight applications were received between August 31, 1909, the date fixed by law for the closing of the annual report of the commissioners, and May 1, 1910, the beginning of the present license year. Eighteen of these were approved and licenses granted, and twenty-one were rejected or withdrawn. Six hundred and fifty-nine applications have been received since April 30. Six hundred and one of these were approved and licenses granted, fifty-two were rejected or withdrawn, and six are awaiting action. Thirty-one transfers of licenses to other persons and nine to other premises have been made.

At the time of the last report, one complaint of the violation of a license had been received on which a hearing was pending. This hearing was held September 3, 1909, and the license was revoked. Thirteen formal complaints of violations of licenses have been received since August 31, 1909. Twelve of these have been made by special agents and one by Chief of Police M. J. Healy, of Manchester. Hearings have been held on twelve of these complaints, and in one case a hearing is pending. Eleven of these licenses have been revoked and one complaint dismissed. Since the license law went into effect, May 19, 1903, one hundred and eight licenses have been revoked and thirty-eight complaints dismissed.

Three special agents have been employed during the year. They have visited all licensed places at various

times, examined locations where licenses were desired, taken samples of liquor for analysis, instructed licensees, reported cases of misconduct, filed complaints of violations, and conducted most of the cases for the state in hearings before the commissioners. They have been required to make weekly reports in writing in regard to all places visited and the work performed in detail. Fred E. Webster, who had served as office clerk since April 14, 1903, resigned January 29, his resignation to take effect February 28. Since that time, Frank H. Dustin, of Concord, has been employed as clerk.

Under the license law one-half of the amount received from fees and forfeitures, after deducting the cost of maintaining the office of the commissioners and other expenses, is paid to the city or town in which the license was exercised and one-half to the county in which the city or town is located. Since the law went into effect the municipalities and counties have received the sum of \$2,468,214.11, with a further payment to be made at the end of the present license year. The total amount received by the treasurer, less rebates, for the year ending April 30, 1910, was \$266,437.38. The amount received by him for the first four months of the present license year has been \$262,781.91. Thirteen bonds have been paid during the year amounting with costs to \$11,850.90. The sum of \$13,800 is now due the state on fifteen bonds.

In accordance with Section 2, Chapter 95, Session Laws 1903, which provides that the annual report of the commissioners shall contain such suggestions as to the general policy of the state and amendments of the license law as they deem appropriate, they suggest the following amendments:

1. The only provisions in the license law in regard to the quality of liquors are as follows: "It shall not be lawful to sell or expose for sale, or to have on the premises where liquor is sold, any liquor which is adulterated with any deleterious drug, substance or liquid which is poisonous or injurious to the health." There is also a provision

that liquor kept by a licensed dealer shall not be different from what it purports to be. The commissioners think it would be beneficial to have a definite standard for liquors, and they recommend that such a change be made in the law.

2. There is no provision in the law for the legal sale of liquor in the case of bankruptcy or death of a licensee or the revocation of a license, and the commissioners recommend that the following provisions be made: If a licensee becomes bankrupt or dies before the expiration of his license, his trustee, executor or administrator may sell the liquor which came into his possession to persons out of the state or to a licensee. All sales made under this provision shall be accompanied by immediate and actual delivery and shall be made within ninety days after the appointment of such trustee, executor or administrator. If a license is revoked, the licensee, after such revocation, may sell the liquor in his possession at the time of such revocation, to persons out of the state or to a licensee. All sales made under this provision shall be accompanied by immediate and actual delivery and shall be made within thirty days after such revocation.

3. The following amendments of the law relating to druggists and apothecaries are recommended: A registered pharmacist who owns stock of the actual value of at least five hundred dollars in a corporation which has been incorporated for the purpose of carrying on the drug business, and who conducts in person the business of a store of such corporation, shall be entitled to receive a license for such store in his own name, providing he be otherwise qualified. A registered pharmacist who is a member of a partnership which has been formed for the purpose of carrying on the drug business, and who conducts in person the business of a store of such partnership, shall be entitled to receive a license for such store in his own name, providing he be otherwise qualified.

4. In the opinion of the commissioners the law does not require the closing of saloons, and other licensed places

where liquor is sold, on the days when primaries are held. They recommend that the law be so amended as to provide that licensed places be closed on those days, the same as on the day of any general or city election or town meeting.

The report of the treasurer for the year ending August 31, 1910, is hereto annexed and made a part of this report. It contains statements of the amounts received from fees, forfeitures and interest, together with disbursements, also various tables giving information required by law.

Respectfully submitted,

CYRUS H. LITTLE,  
HENRY W. KEYES,  
JOHN KIVEL,

*State Board of License Commissioners.*

CONCORD, September 1, 1910.

## TREASURER'S REPORT.

---

### FINANCIAL STATEMENT

For the year ending April 30, 1910.

Table No. 1.

#### RECEIPTS.

Fees from licenses granted . . . . .	\$259,548.98	
Fees from licenses transferred . . . . .	350.00	
Forfeitures . . . . .	7,750.90	
	<hr/>	
	\$267,649.88	
Less rebates paid . . . . .	1,212.50	
	<hr/>	\$266,437.38

#### DISBURSEMENTS.

Expenses . . . . .	\$19,910.56	
Less interest on deposits . . . . .	1,812.97	
	<hr/>	\$18,097.59
Paid to cities, towns and counties . . . . .	248,339.79	
	<hr/>	\$266,437.38



## FINANCIAL STATEMENT

From May 1, 1910, to July 15, 1910.

Table No. 2.

DR.

To fees from licenses granted .	\$254,707.00	
"    "    "    transferred	60.00	
forfeitures . . . . .	5,600.00	
	<hr/>	\$260,367.00

CR.

By rebates on licenses surren- dered . . . . .	*\$599.99	
" payment to cities and towns	116,876.47	
"    "    "    counties . .	116,913.87	
" amount reserved for disburse- ments, May 1, 1910, to April 30, 1911, (10 per cent.) . .	25,976.67	
	<hr/>	\$260,367.00

\* See Statement, page 42.

# FINANCIAL STATEMENT

July 16, 1910, to August 31, 1910.

Table No. 3.

## DR.

To fees from licenses granted . . . . .	†\$1,502.77
“ fees from licenses transferred . . . . .	†80.00
“ interest allowed on deposits . . . . .	832.14
“ amount reserved for disbursements, (per table No. 2.) . . . . .	25,976.67
	<hr/>
	\$28,391.58

## CR.

By expense, May 1, 1910, to August 31, 1910	\$6,783.51
“ balance on hand . . . . .	21,605.31
“ overpayment town of Haverhill, year ending April 30, 1909 . . . . .	2.76
	<hr/>
	\$28,391.58

†See statement, page 42.

## CLASSIFIED STATEMENT OF EXPENSES

For the year ending April 30, 1910,

SHOWING DISPOSITION OF INTEREST RECEIVED  
ON DEPOSITS.

Salaries of commissioners . . . . .	\$7,400.00
Expenses of commissioners . . . . .	840.01
Clerical expenses . . . . .	2,050.00
Salaries of special agents . . . . .	3,700.00
Expenses of special agents . . . . .	2,196.22
Rent . . . . .	840.00
Lights . . . . .	50.68
Postage . . . . .	149.11
Printing and stationery . . . . .	661.08
Telephone and telegraph . . . . .	190.37
Costs (complaints and hearings) . . . . .	247.96
Incidentals . . . . .	925.13
	<hr/>
	\$19,250.56
Paid State Laboratory of Hygiene . . . . .	660.00
	<hr/>
Total . . . . .	\$19,910.56
Deduct interest received on deposits . . . . .	1,812.97
	<hr/>
Balance apportioned to cities and towns . . . . .	\$18,097.59

# CLASSIFIED STATEMENT OF EXPENSES

From May 1, 1910, to August 31, 1910, inclusive.

Salaries of commissioners . . . . .	\$2,466.66
Expenses of commissioners . . . . .	322.13
Clerical expenses . . . . .	740.00
Salaries of special agents . . . . .	1,174.16
Expenses of special agents. . . . .	821.89
Rent . . . . .	280.00
Lights . . . . .	16.04
Printing and stationery . . . . .	33.35
Annual report (1909) . . . . .	400.71
Telephone and telegraph . . . . .	57.48
Costs (complaints and hearings) . . . .	164.97
Incidentals . . . . .	66.12
	<hr/>
	\$6,543.51
Paid State Laboratory of Hygiene . . .	240.00
	<hr/>
	\$6,783.51



## STATISTICAL TABLES





## BELKNAP COUNTY.

### *Statement*

Showing the amount received from license fees, transfer fees and forfeitures, the total receipts, the amount of rebates paid on licenses surrendered, and the receipts less rebates, for each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Amount received from			Total receipts.	Rebates paid.	Receipts less rebates.
	License fees.	Transfer fees.	Forfeitures.			
Barnstead.....	\$300.00	.....	.....	\$300.00	.....	\$300.00
Belmont.....	23.39	.....	.....	23.39	.....	23.39
Center Harbor.....	23.46	.....	.....	23.46	.....	23.46
Laconia.....	437.47	.....	\$1,000.00	1,437.47	.....	1,437.47
*Lake Winnepesaukee .	20.84	.....	.....	20.84	.....	20.84
Meredith.....	20.00	.....	.....	20.00	.....	20.00
Tilton.....	30.00	.....	.....	30.00	.....	30.00
Total.....	\$855.16	.....	\$1,000.00	\$1,855.16	.....	\$1,855.16

\* One sixth-class license exercised upon the waters of Lake Winnepesaukee in the counties of Belknap and Carroll, and not in any town in said counties. (See Carroll County.)

## CARROLL COUNTY.

*Statement*

Showing the amount received from license fees, transfer fees and forfeitures, the total receipts, the amount of rebates paid on licenses surrendered, and the receipts less rebates, for each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Amount received from			Total receipts.	Rebates paid.	Receipts less rebates.
	License fees.	Transfer fees.	Forfeitures.			
Conway.....	\$91.67	.....	.....	\$91.67	.....	\$91.67
Jackson.....	42.64	.....	.....	42.64	.....	42.64
*Lake Winnepesaukee .	20.83	.....	.....	20.83	.....	20.83
Ossipee.....	49.33	.....	.....	49.33	.....	49.33
Wakefield.....	130.70	.....	.....	130.70	.....	130.70
Wolfeboro.....	73.98	\$10.00	.....	83.98	.....	83.98
Total.....	\$409.15	\$10.00	.....	\$419.15	.....	\$419.15

\* See footnote, Belknap County.

CHESHIRE COUNTY.

*Statement*

Showing the amount received from license fees, transfer fees and forfeitures, the total receipts, the amount of rebates paid on licenses surrendered, and the receipts less rebates, for each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Amount received from			Total receipts.	Rebates paid.	Receipts less rebates.
	License fees.	Transfer fees.	Forfeitures.			
Alstead.....	\$971.16	.....	.....	\$971.16	.....	\$971.16
Chesterfield .....	90.21	.....	.....	90.21	.....	90.21
Hinsdale.....	92.98	.....	.....	92.98	.....	92.98
Keene.....	225.54	.....	.....	225.54	.....	225.54
Walpole.....	58.69	.....	\$500.00	558.69	.....	558.69
Winchester.....	10.00	.....	.....	10.00	.....	10.00
Total.....	\$1,448.58	.....	\$500.00	\$1,948.58	.....	\$1,948.58

## COOS COUNTY.

*Statement*

Showing the amount received from license fees, transfer fees and forfeitures, the total receipts, the amount of rebates paid on licenses surrendered, and the receipts less rebates, for each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Amount received from			Total receipts.	Rebates paid.	Receipts less rebates.
	License fees.	Transfer fees.	Forfeitures.			
Berlin.....	\$219.10	.....	\$2,045.21	\$2,264.31	.....	\$2,264.31
Carroll.....	589.79	.....	.....	589.79	.....	589.79
Colebrook.....	87.51	.....	500.00	587.51	.....	587.51
Gorham.....	3,891.94	.....	.....	3,891.94	.....	3,891.94
Jefferson.....	52.78	.....	.....	52.78	.....	52.78
Lancaster.....	135.00	.....	.....	135.00	.....	135.00
Northumberland.....	144.17	.....	.....	144.17	.....	144.17
Stewartstown.....	228.47	.....	.....	228.47	.....	228.47
Stratford.....	29.17	.....	.....	29.17	.....	29.17
Whitefield.....	47.58	.....	.....	47.58	.....	47.58
Total.....	\$5,425.51	.....	\$2,545.21	\$7,970.72	.....	\$7,970.72

## GRAFTON COUNTY.

*Statement*

Showing the amount received from license fees, transfer fees and forfeitures, the total receipts, the amount of rebates paid on licenses surrendered, and the receipts less rebates for each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Amount received from			Total receipts.	Rebates paid.	Receipts less rebates.
	License fees.	Transfer fees.	Forfeitures.			
Ashland.....	\$20.00	.....	.....	\$20.00	.....	\$20.00
Benton.....	20.77	.....	.....	20.77	.....	20.77
Bethlehem.....	72.42	.....	.....	72.42	.....	72.42
Bristol.....	53.48	.....	.....	53.48	.....	53.48
Canaan.....	16.43	.....	.....	16.43	.....	16.43
Enfield.....	35.00	.....	.....	35.00	.....	35.00
Franconia.....	86.96	.....	.....	86.96	.....	86.96
Haverhill.....	111.34	.....	.....	111.34	.....	111.34
Holderness.....	18.88	.....	.....	18.88	.....	18.88
Lebanon.....	30.00	.....	.....	30.00	.....	30.00
Lisbon.....	70.00	.....	.....	70.00	.....	70.00
Littleton.....	80.00	.....	.....	80.00	.....	80.00
Plymouth.....	130.00	.....	.....	130.00	.....	130.00
Woodstock.....	9.39	.....	.....	9.39	.....	9.39
Total.....	\$754.67	.....	.....	\$754.67	.....	\$754.67



## HILLSBOROUGH COUNTY.

*Statement*

Showing the amount received from license fees, transfer fees and forfeitures, the total receipts, the amount of rebates paid on licenses surrendered, and the receipts less rebates, for each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Amount received from			Total receipts.	Rebates paid.	Receipts less rebates.
	License fees.	Transfer fees.	Forfeitures.			
Bennington.....	\$1,496.67	.....	.....	\$1,496.67	.....	\$1,496.67
Goffstown.....	10.00	.....	.....	10.00	.....	10.00
Greenville.....	2,797.58	.....	.....	2,797.58	.....	2,797.58
Hillsborough.....	19.84	.....	.....	19.84	.....	19.84
Manchester.....	113,770.94	\$20.00	\$500.00	114,290.94	\$37.50	114,253.44
Milford.....	17.95	.....	.....	17.95	.....	17.95
Nashua.....	43,492.09	90.00	1,005.69	44,587.78	1,050.00	43,537.78
New Boston.....	48.52	.....	.....	48.52	.....	48.52
Pelham.....	24.87	.....	.....	24.87	.....	24.87
Peterborough.....	24.33	.....	.....	24.33	.....	24.33
Wilton.....	10.00	.....	.....	10.00	.....	10.00
Total.....	\$161,712.79	\$110.00	\$1,505.69	\$163,328.48	\$1,087.50	\$162,240.98

MERRIMACK COUNTY.

*Statement*

Showing the amount received from license fees, transfer fees and forfeitures, the total receipts, the amount of rebates paid on licenses surrendered, and the receipts less rebates, for each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Amount received from			Total receipts.	Rebates paid.	Receipts less rebates.
	License fees.	Transfer fees.	Forfeitures.			
Allenstown.....	\$1,549.85	\$30.00	.....	\$1,579.85	\$104.17	\$1,475.68
Andover.....	250.00	.....	.....	250.00	.....	250.00
Concord.....	623.88	10.00	.....	633.88	20.83	613.05
Franklin.....	151.48	.....	.....	151.48	.....	151.48
Henniker.....	10.00	.....	.....	10.00	.....	10.00
Hooksett.....	850.00	.....	.....	850.00	.....	850.00
New London.....	10.00	.....	.....	10.00	.....	10.00
Pembroke.....	3,091.25	10.00	.....	3,101.25	.....	3,101.25
Pittsfield.....	10.00	.....	.....	10.00	.....	10.00
Total.....	\$6,546.46	\$50.00	.....	\$6,596.46	\$125.00	\$6,471.46

## ROCKINGHAM COUNTY.

*Statement*

Showing the amount received from license fees, transfer fees and forfeitures, the total receipts, the amount of rebates paid on licenses surrendered, and the receipts less rebates, for each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Amount received from			Total receipts.	Rebates paid.	Receipts less rebates.
	License fees.	Transfer fees.	Forfeitures.			
Derry.....	\$1,528.22	\$10.00	.....	\$1,538.22	.....	\$1,538.22
Epping.....	1,550.00	.....	.....	1,550.00	.....	1,550.00
Exeter.....	140.00	10.00	.....	150.00	.....	150.00
Hampton.....	335.00	.....	.....	335.00	.....	335.00
Kingston.....	200.00	.....	.....	200.00	.....	200.00
Newcastle.....	44.73	.....	.....	44.73	.....	44.73
Newfields.....	700.00	20.00	.....	720.00	.....	720.00
Newmarket.....	3,067.74	10.00	.....	3,077.74	.....	3,077.74
Northwood.....	47.84	.....	.....	47.84	.....	47.84
Nottingham.....	250.00	.....	.....	250.00	.....	250.00
Portsmouth.....	35,190.14	20.00	\$1,200.00	36,410.14	.....	36,410.14
Raymond.....	10.00	.....	.....	10.00	.....	10.00
Rye.....	66.12	.....	.....	66.12	.....	66.12
Total.....	\$43,129.79	\$70.00	\$1,200.00	\$44,399.79	.....	\$44,399.79

STRAFFORD COUNTY.

*Statement*

Showing the amount received from license fees, transfer fees and forfeitures, the total receipts, the amount of rebates paid on licenses surrendered, and the receipts less rebates, for each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Amount received from			Total receipts.	Rebates paid.	Receipts less rebates.
	License fees.	Transfer fees.	Forfeitures.			
Dover.....	\$23,955.64	\$40.00	\$1,000.00	\$24,995.64	.....	\$24,995.64
Farmington.....	146.37	.....	.....	146.37	.....	146.37
Milton.....	909.65	.....	.....	909.65	.....	909.65
Rochester.....	290.46	.....	.....	290.46	.....	290.46
Rollinsford.....	3,150.00	.....	.....	3,150.00	.....	3,150.00
Somersworth.....	10,547.85	60.00	.....	10,607.85	.....	10,607.85
Total.....	\$38,999.97	\$100.00	\$1,000.00	\$40,099.97	.....	\$40,099.97

## SULLIVAN COUNTY.

*Statement*

Showing the amount received from license fees, transfer fees and forfeitures, the total receipts, the amount of rebates paid on licenses surrendered, and the receipts less rebates, for each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Amount received from			Total receipts.	Rebates paid.	Receipts less rebates.
	License fees.	Transfer fees.	Forfeitures.			
Charlestown.....	\$8.94	.....	.....	\$8.94	.....	\$8.94
Claremont.....	189.84	\$10.00	.....	199.84	.....	199.84
Croydon.....	50.00	.....	.....	50.00	.....	50.00
Newport.....	18.12	.....	.....	18.12	.....	18.12
Total.....	\$266.90	\$10.00	.....	\$276.90	.....	\$276.90

# RECAPITULATION

For the year ending April 30, 1910.

Counties.	Amount received from			Total receipts.	Rebates paid.	Receipts less rebates.
	License fees.	Transfer fees.	Forfeitures.			
Belknap.....	\$855.16	.....	\$1,000.00	\$1,855.16	.....	\$1,855.16
Carroll.....	409.15	10.00	.....	419.15	.....	419.15
Cheshire.....	1,448.58	.....	500.00	1,948.58	.....	1,948.58
Coos.....	5,425.51	.....	2,545.21	7,970.72	.....	7,970.72
Grafton.....	754.67	.....	.....	754.67	.....	754.67
Hillsborough.....	161,712.79	110.00	1,505.69	163,328.48	\$1,087.50	162,240.98
Merrimack.....	6,546.46	50.00	.....	6,596.46	125.00	6,471.46
Rockingham.....	43,129.79	70.00	1,200.00	44,399.79	.....	44,399.79
Strafford.....	38,999.97	100.00	1,000.00	40,099.97	.....	40,099.97
Sullivan.....	266.90	10.00	.....	276.90	.....	276.90
Total.....	\$259,548.98	\$350.00	\$7,750.90	\$267,649.88	\$1,212.50	\$266,437.38



## BELKNAP COUNTY.

## Statement

Showing the receipts, less rebates paid on licenses surrendered, the pro rata expense of maintaining office, the amount distributable, and the amount paid each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Receipts less rebates.	Pro rata expense of maintaining office.	Amount distributable.	Amount paid city or town for the year ending April 30, 1910.			Amount paid county of Belknap for the year ending April 30, 1910.		
				Paid July 31, 1909.	Paid July 30, 1910.	Total.	Paid July 31, 1909.	Paid July 30, 1910.	Total.
Barnstead.....	\$300.00	\$20.38	\$279.62	\$135.00	\$4.81	\$139.81	\$135.00	\$4.81	\$139.81
Belmont.....	23.39	1.59	21.80	10.53	.37	10.90	10.35	.37	10.90
Center Harbor.....	23.46	1.59	21.87	10.55	.39	10.94	10.55	.38	10.93
Laconia.....	1,437.47	97.64	1,339.83	186.01	483.91	669.92	186.01	483.90	669.91
*Lake Winnepesaukee.	20.84	1.42	19.42	.....	.....	.....	18.76	.66	19.42
Meredith.....	20.00	1.36	18.64	9.00	.32	9.32	9.00	.32	9.32
Tilton.....	30.00	2.04	27.96	13.50	.48	13.98	13.50	.48	13.98
Total.....	\$1,855.16	\$126.02	\$1,729.14	\$364.59	\$490.28	\$854.87	\$383.35	\$490.92	\$874.27

\* One sixth-class license exercised upon the waters of Lake Winnepesaukee in the counties of Belknap and Carroll and not in any town in said counties. Fee divided equally between said counties. (See Carroll County.)

# CARROLL COUNTY.

## Statement

Showing the receipts, less rebates paid on licenses surrendered, the pro rata expense of maintaining office, the amount distributable, and the amount paid each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Receipts less rebates.	Pro rata expense of maintaining office.	Amount distributable.	Amount paid city or town for the year ending April 30, 1910.		Amount paid county of Carroll for the year ending April 30, 1910.	
				Paid July 31, 1909.	Paid July 30, 1910.	Paid July 31, 1909.	Paid July 30, 1910.
Conway.....	\$91.67	\$6.23	\$85.44	\$41.25	\$1.47	\$41.25	\$1.47
Jackson.....	42.64	2.90	39.74	19.19	.68	19.19	.68
*Lake Winnepesaukee.....	20.83	1.41	19.42			18.75	.67
Ossipee.....	49.33	3.35	45.98	22.20	.79	22.20	.79
Wakefield.....	130.70	8.88	121.82	58.81	2.10	58.81	2.10
Wolfeboro.....	83.98	5.70	78.28	31.50	7.64	31.50	7.64
Total.....	\$419.15	\$28.47	\$390.68	\$172.95	\$12.68	\$191.70	\$13.35
							\$205.05

\* See footnote, Belknap County.

## CHESHIRE COUNTY.

*Statement*

Showing the receipts, less rebates paid on licenses surrendered, the pro rata expense of maintaining office, the amount distributable, and the amount paid each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Receipts less rebates.	Pro rata expense of main- taining office.	Amount distribu- table.	Amount paid city or town for the year ending April 30, 1910.		Amount paid county of Cheshire for the year ending April 30, 1910.	
				Paid July 31, 1909.	Paid July 30, 1910.	Paid July 31, 1909.	Paid July 30, 1910.
Alstead.....	\$871.16	\$65.96	\$905.20	\$437.03	\$15.57	\$437.03	\$15.57
Chesterfield.....	90.21	6.13	84.08	40.59	1.45	40.59	1.45
Hinsdale.....	92.98	6.32	86.66	41.84	1.49	41.84	1.49
Keene.....	225.54	15.32	210.22	67.50	37.61	67.50	37.61
Walpole.....	558.69	37.95	520.74	26.41	233.96	26.41	233.96
Winchester.....	10.00	.68	9.32	4.50	.16	4.50	.16
Total.....	\$1,948.58	\$132.36	\$1,816.22	\$617.87	\$290.24	\$617.87	\$290.24
						\$908.11	\$908.11

# COOS COUNTY.

## Statement

Showing the receipts, less rebates paid on licenses surrendered, the pro rata expense of maintaining office, the amount distributable, and the amount paid each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Receipts less rebates.	Pro rata expense of maintaining office.	Amount distributable.	Amount paid city or town for the year ending April 30, 1910.			Amount paid county of Coos for the year ending April 30, 1910.		
				Paid July 31, 1909.	Paid July 30, 1910.	Total.	Paid July 31, 1909.	Paid July 30, 1910.	Total.
Berlin.....	\$2,204.31	\$153.80	\$2,110.51	\$86.25	\$959.01	\$1,055.26	\$86.24	\$959.01	\$1,055.25
Carroll.....	589.79	40.06	549.73	265.40	9.47	274.87	265.40	9.46	274.86
Colebrook.....	587.51	39.91	547.60	264.38	9.42	273.80	264.38	9.42	273.80
Gorham.....	3,891.94	264.36	3,627.58	1,751.38	62.41	1,813.79	1,751.38	62.41	1,813.79
Jefferson.....	52.78	3.59	49.19	23.75	55	24.60	23.75	84	24.59
Leicester.....	135.00	9.17	125.83	60.75	2.17	62.92	60.75	2.16	62.91
Northumberland.....	144.17	9.79	134.38	64.87	2.32	67.19	64.87	2.32	67.19
Stewartstown.....	228.47	15.52	212.95	102.82	3.66	106.47	102.82	3.65	106.48
Stratford.....	29.17	1.98	27.19	.....	13.60	13.60	.....	13.59	13.59
Whitfield.....	47.58	3.23	44.35	21.41	76	22.17	21.41	77	22.18
Total.....	\$7,970.72	\$541.41	\$7,429.31	\$2,651.01	\$1,063.67	\$3,714.67	\$2,651.00	\$1,063.63	\$3,714.64

## GRAFTON COUNTY.

## Statement

Showing the receipts, less rebates paid on licenses surrendered, the pro rata expense of maintaining office, the amount distributable, and the amount paid each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Receipts less rebates.	Pro rata expense of maintaining office.	Amount distributable.	Amount paid city or town for the year ending April 30, 1910.			Amount paid county of Grafton for the year ending April 30, 1910.		
				Paid July 31, 1909.	Paid July 30, 1910.	Total.	Paid July 31, 1909.	Paid July 30, 1910.	Total.
Ashland.....	\$20.00	\$1.36	\$18.64	\$9.00	\$0.32	\$9.32	\$9.00	\$0.32	\$9.32
Benton.....	20.77	1.41	19.36	9.34	9.34	9.68	9.35	.33	9.68
Bethlehem.....	72.42	4.92	67.50	32.50	1.16	33.75	32.59	1.16	33.75
Bristol.....	53.48	3.63	49.85	24.07	.86	24.93	24.07	.85	24.92
Canaan.....	16.43	1.12	15.31	4.38	3.28	7.66	4.38	3.27	7.65
Enfield.....	35.00	2.38	32.62	15.75	.56	16.31	15.75	.56	16.31
Franconia.....	86.96	5.91	81.05	22.13	18.39	40.52	22.14	18.39	40.53
Haverhill.....	111.34	7.56	103.78	47.35	4.54	51.89	50.10	1.79	51.89
Holderness.....	18.88	1.28	17.60	.....	8.80	8.80	.....	8.80	8.80
Lebanon.....	30.00	2.04	27.96	13.50	.48	13.98	13.50	.48	13.98
Lisbon.....	70.00	4.75	65.25	31.50	1.13	32.63	31.50	1.12	32.62
Littleton.....	80.00	5.43	74.57	36.00	1.29	37.29	36.00	1.28	37.28
Plymouth.....	130.00	8.83	121.17	58.50	2.08	60.58	58.50	2.09	60.59
Woodstock.....	9.39	.64	8.75	4.22	.16	4.38	4.22	.15	4.37
Total.....	\$754.67	\$51.26	\$703.41	\$308.33	\$43.39	\$351.72	\$311.10	\$40.59	\$351.69

# HILLSBOROUGH COUNTY.

## Statement

Showing the receipts, less rebates paid on licenses surrendered, the pro rata expense of maintaining office, the amount distributable, and the amount paid each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Receipts less rebates.	Pro rata expense of maintaining office.	Amount distributable.	Amount paid city or town for the year ending April 30, 1910.			Amount paid county of Hillsborough for the year ending April 30, 1910.		
				Paid July 31, 1909.	Paid July 30, 1910.	Total.	Paid July 31, 1909.	Paid July 30, 1910.	Total.
Bennington.....	\$1,496.67	\$101.66	\$1,395.01	\$673.50	\$24.01	\$697.51	\$673.50	\$24.00	\$697.50
Goffstown.....	10.00	.68	9.32	4.50	.16	4.66	4.50	.16	4.66
Greenville.....	2,797.58	190.02	2,607.56	1,258.91	44.87	1,303.78	1,258.91	44.87	1,303.78
Hillsborough.....	19.84	1.35	18.49	8.93	.32	9.25	8.93	.31	9.24
Manchester.....	114,253.44	7,760.58	106,492.86	51,123.49	2,122.94	53,246.43	51,123.49	2,122.94	53,246.43
Milford.....	17.95	1.22	16.73	.....	8.37	8.37	.....	8.36	8.36
Nashua.....	43,537.78	2,957.27	40,580.51	18,849.28	1,440.98	20,290.26	18,849.28	1,440.97	20,290.25
New Boston.....	3.30	3.30	45.22	21.83	.78	22.61	21.83	.78	22.61
Pelham.....	48.52	1.69	23.18	11.19	.40	11.59	11.19	.40	11.59
Peterborough.....	24.87	1.65	22.68	10.95	.39	11.34	10.95	.39	11.34
Wilton.....	24.33	1.65	22.68	10.95	.39	11.34	10.95	.39	11.34
Wilton.....	10.00	.68	9.32	4.50	.16	4.66	4.50	.16	4.66
Total.....	\$162,240.98	\$11,020.10	\$151,220.88	\$71,967.08	\$3,643.38	\$75,610.46	\$71,967.08	\$3,643.34	\$75,610.42



## MERRIMACK COUNTY.

## Statement

Showing the receipts, less rebates paid on licenses surrendered, the pro rata expense of maintaining office, the amount distributable, and the amount paid each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Receipts less rebates.	Pro rata expense of main- taining office.	Amount distrib- utable.	Amount paid city or town for the year ending April 30, 1910.			Amount paid county of Merrimack for the year ending April 30, 1910.		
				Paid July 31, 1909.	Paid July 30, 1910.	Total.	Paid July 31, 1909.	Paid July 30, 1910.	Total.
Allentown.....	\$1,475.68	\$100.23	\$1,375.45	\$675.00	\$12.73	\$687.73	\$675.00	\$12.72	\$687.72
Andover.....	250.00	16.98	233.02	112.50	4.01	116.51	112.50	4.01	116.51
Concord.....	613.05	41.64	571.41	280.75	4.96	285.71	280.74	4.96	285.70
Franklin.....	151.48	10.29	141.19	68.17	2.43	70.60	68.17	2.42	70.59
Henniker.....	10.00	.68	9.32	4.50	.16	4.66	4.50	.16	4.66
Hooksett.....	850.00	57.74	792.26	382.50	13.63	396.13	382.50	13.63	396.13
New London.....	10.00	.68	9.32	4.50	.16	4.66	4.50	.16	4.66
Pembroke.....	3,101.25	210.65	2,890.60	1,332.00	113.30	1,445.30	1,332.00	113.30	1,445.30
Pittsfield.....	10.00	.68	9.32	4.50	.16	4.66	4.50	.16	4.66
Total.....	\$6,471.46	\$439.57	\$6,031.89	\$2,864.42	\$151.54	\$3,015.96	\$2,864.41	\$151.52	\$3,015.93

# ROCKINGHAM COUNTY.

## Statement

Showing the receipts, less rebates paid on licenses surrendered, the pro rata expense of maintaining office, the amount distributable, and the amount paid each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Receipts less rebates.	Pro rata expense of maintaining office.	Amount distributable.	Amount paid city or town for the year ending April 30, 1910.			Amount paid county of Rockingham for the year ending April 30, 1910.		
				Paid July 31, 1909.	Paid July 30, 1910.	Total.	Paid July 31, 1909.	Paid July 30, 1910.	Total.
Derry.....	\$1,538.22	\$104.48	\$1,433.74	\$687.70	\$29.17	\$716.87	\$687.70	\$29.17	\$716.87
Epping.....	1,550.00	105.28	1,444.72	697.50	24.86	722.36	697.50	24.86	722.36
Exeter.....	150.00	10.19	139.81	63.00	6.91	69.91	63.00	6.90	69.90
Hampton.....	335.00	22.76	312.24	130.75	5.37	136.12	130.75	5.37	136.12
Kingston.....	200.00	13.59	186.41	90.00	3.21	93.20	90.00	3.20	93.21
Newcastle.....	44.73	3.04	41.69	20.13	.72	20.85	20.13	.71	20.84
Newfields.....	720.00	48.91	671.09	315.00	20.54	335.55	315.00	20.55	335.54
Newmarket.....	3,077.74	209.05	2,868.69	1,380.48	53.86	1,434.34	1,380.49	53.86	1,434.35
Northwood.....	47.84	3.25	44.59	21.52	.78	22.30	21.52	.77	22.29
Nottingham.....	250.00	16.98	233.02	112.50	4.01	116.51	112.50	4.01	116.51
Portsmouth.....	36,410.14	2,473.13	33,937.01	15,363.88	1,604.63	16,968.51	15,363.88	1,604.62	16,968.50
Raymond.....	10.00	.68	9.32	4.50	.16	4.66	4.50	.16	4.66
Rye.....	66.12	4.49	61.63	29.75	1.07	30.82	29.75	1.06	30.81
Total.....	\$44,399.79	\$3,015.83	\$41,383.96	\$18,936.71	\$1,755.29	\$20,692.00	\$18,936.72	\$1,755.24	\$20,691.96

## STAFFORD COUNTY.

*Statement*

Showing the receipts, less rebates paid on licenses surrendered, the pro rata expense of maintaining office, the amount distributable, and the amount paid each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Receipts less rebates.	Pro rata expense of main- taining office.	Amount distrib- utable.	Amount paid city or town for the year ending April 30, 1910.			Amount paid county of Strafford for the year ending April 30, 1910.		
				Paid July 31, 1909.	Paid July 30, 1910.	Total.	Paid July 31, 1909.	Paid July 30, 1910.	Total.
Dover.....	\$24,995.64	\$1,697.81	\$23,297.83	\$10,780.04	\$868.88	\$11,648.92	\$10,780.04	\$868.87	\$11,648.91
Farmington.....	146.37	9.94	136.43	65.87	2.35	68.22	65.87	2.34	68.21
Milton.....	909.65	61.79	847.86	409.34	14.59	423.93	409.34	14.59	423.93
Rochester.....	290.46	19.73	270.73	8.52	126.85	135.37	8.52	126.84	135.36
Rollinsford.....	3,150.00	213.96	2,936.04	1,417.50	50.52	1,468.02	1,417.50	50.52	1,468.02
Somersworth.....	10,607.85	720.53	9,887.32	4,751.03	192.63	4,943.66	4,751.03	192.63	4,943.66
Total.....	\$40,099.97	\$2,723.76	\$37,376.21	\$17,432.30	\$1,255.82	\$18,688.12	\$17,432.30	\$1,255.79	\$18,688.09

SULLIVAN COUNTY.

*Statement*

Showing receipts, less rebates paid on licenses surrendered, the pro rata expense of maintaining office, the amount distributable, and the amount paid each city, town, and county, for the year ending April 30, 1910.

Cities and Towns.	Receipts less rebates.	Pro rata expense of maintaining office.	Amount distributable.	Amount paid city or town for the year ending April 30, 1910.			Amount paid county of Sullivan for the year ending April 30, 1910.		
				Paid July 31, 1909.	Paid July 30, 1910.	Total.	Paid July 31, 1909.	Paid July 30, 1910.	Total.
Charlestown.....	\$8.94	\$0.61	\$8.33	\$4.02	\$0.15	\$4.17	\$4.02	\$0.14	\$4.16
Claremont.....	199.84	13.57	186.27	85.43	7.71	93.14	85.43	7.70	93.13
Croydon.....	50.00	3.40	46.60	22.50	.80	23.30	22.50	.80	23.30
Newport.....	18.12	1.23	16.89	8.16	.29	8.45	8.15	.29	8.44
Total.....	\$276.90	\$18.81	\$258.09	\$120.11	\$8.95	\$129.06	\$120.10	\$8.93	\$129.03

## RECAPITULATION.

[illegible]

BELKNAP COUNTY.

*Statement*

Showing the receipts from May 1, 1910, to July 15, 1910, inclusive, the amount of 10 per cent. reserved on account of expenses and rebates on surrendered licenses for the year ending April 30, 1911, the amount available for distribution July 15, 1910, and the amount paid each city, town, and county, on account of the year ending April 30, 1911.

Cities and Towns.	Receipts from May 1, 1910, to July 15, 1910, inclusive.	10 per cent. reserved.	Available for distribution, July 15, 1910.	Paid city or town July 30, 1910.	Paid county of Belknap July 30, 1910.
Barnstead.....	\$99.46	\$9.95	\$89.51	\$44.76	\$44.75
Belmont.....	32.25	3.23	29.02	14.51	14.51
Center Harbor.....	47.45	4.75	42.70	21.35	21.35
Laconia.....	389.87	38.98	350.89	175.44	175.45
*Lake Winnepesaukee....	20.84	2.08	18.76	.....	18.76
Meredith.....	10.00	1.00	9.00	4.50	4.50
Tilton.....	30.00	3.00	27.00	13.50	13.50
Total.....	\$629.87	\$62.99	\$566.88	\$274.06	\$292.82

\* One sixth-class license exercised upon the waters of Lake Winnepesaukee in the counties of Belknap and Carroll, and not in any town in said counties. Fee divided equally between said counties. (See Carroll County.)



## CARROLL COUNTY.

*Statement*

Showing the receipts from May 1, 1910, to July 15, 1910, inclusive, the amount of 10 per cent. reserved on account of expenses and rebates on surrendered licenses for the year ending April 30, 1911, the amount available for distribution July 15, 1910, and the amount paid each city, town, and county, on account of the year ending April 30, 1911.

Cities and Towns.	Receipts from May 1, 1910, to July 15, 1910, inclusive.	10 per cent. reserved.	Available for distribution, July 15, 1910.	Paid city or town July 30, 1910.	Paid county of Carroll July 30, 1910.
Conway.....	\$115.73	\$11.57	\$104.16	\$52.08	\$52.08
Jackson.....	39.79	3.98	35.81	17.91	17.90
*Lake Winnepesaukee...	20.83	2.08	18.75	.....	18.75
Ossipee.....	75.00	7.50	67.50	33.75	33.75
Wakefield.....	104.59	10.46	94.13	47.06	47.07
Wolfeboro.....	119.49	11.95	107.54	53.77	53.77
Total.....	\$475.43	\$47.54	\$427.89	\$204.57	\$223.32

\* See footnote, Belknap County.

## CHESHIRE COUNTY.

*Statement*

Showing the receipts from May 1, 1910, to July 15, 1910, inclusive, the amount of 10 per cent. reserved on account of expenses and rebates on surrendered licenses for the year ending April 30, 1911, the amount available for distribution July 15, 1910, and the amount paid each city, town, and county, on account of the year ending April 30, 1911.

Cities and Towns.	Receipts from May 1, 1910, to July 15, 1910, inclusive.	10 per cent. reserved.	Available for distribution, July 15, 1910.	Paid city or town July 30, 1910.	Paid county of Cheshire July 30, 1910.
Alstead.....	\$950.00	\$95.00	\$855.00	\$427.50	\$427.50
Chesterfield.....	108.82	10.88	97.94	48.97	48.97
Dublin.....	19.89	1.99	17.90	8.95	8.95
Hinsdale.....	85.00	8.50	76.50	38.25	38.25
Keene.....	250.00	25.00	225.00	112.50	112.50
Winchester.....	9.30	.93	8.37	4.19	4.18
Total.....	\$1,423.01	\$142.30	\$1,280.71	\$640.36	\$640.35

## COOS COUNTY.

*Statement*

Showing the receipts from May 1, 1910, to July 15, 1910, inclusive, the amount of 10 per cent. reserved on account of expenses and rebates on surrendered licenses for the year ending April 30, 1911, the amount available for distribution July 15, 1910, and the amount paid each city, town, and county, on account of the year ending April 30, 1911.

Cities and Towns.	Receipts from May 1, 1910, to July 15, 1910, inclusive.	10 per cent. reserved.	Available for distribution, July 15, 1910.	Paid city or town July 30, 1910.	Paid county of Coos July 30, 1910.
Berlin.....	\$609.13	\$60.91	\$548.22	\$274.11	\$274.11
Carroll.....	583.36	58.34	525.02	262.51	262.51
Colebrook.....	109.87	10.99	98.88	49.44	49.44
Errol.....	43.76	4.37	39.39	19.69	19.70
Gorham.....	3,900.00	390.00	3,510.00	1,755.00	1,755.00
Jefferson.....	52.51	5.25	47.26	23.63	23.63
Lancaster.....	135.00	13.50	121.50	60.75	60.75
Northumberland.....	210.00	21.00	189.00	94.50	94.50
Stewartstown.....	225.00	22.50	202.50	101.25	101.25
Stratford.....	50.00	5.00	45.00	22.50	20.50
Whitefield.....	44.59	4.46	40.13	20.07	20.06
Total.....	\$5,963.22	\$596.32	\$5,366.90	\$2,683.45	\$2,683.45

GRAFTON COUNTY.

*Statement*

Showing the receipts from May 1, 1910, to July 15, 1910, inclusive, the amount of 10 per cent. reserved on account of expenses and rebates on surrendered licenses for the year ending April 30, 1911, the amount available for distribution July 15, 1910, and the amount paid each city, town, and county, on account of the year ending April 30, 1911.

Cities and Towns.	Receipts from May 1, 1910, to July 15, 1910, inclusive.	10 per cent. reserved.	Available for distribution, July 15, 1910.	Paid city or town July 30, 1910.	Paid county of Grafton, July 30, 1910.
Ashland.....	\$66.44	\$6.65	\$59.79	\$29.90	\$29.89
Bethlehem.....	98.99	9.90	89.09	44.54	44.55
Bristol.....	60.00	6.00	54.00	27.00	27.00
Canaan.....	10.00	1.00	9.00	4.50	4.50
Enfield.....	34.93	3.49	31.44	15.72	15.72
Franconia.....	48.79	4.88	43.91	21.96	21.95
Haverhill.....	109.17	10.92	98.25	49.12	49.13
Lebanon.....	29.94	2.99	26.95	13.48	13.47
Lisbon.....	70.00	7.00	63.00	31.50	31.50
Littleton.....	79.87	7.98	71.89	35.95	35.94
Plymouth.....	123.44	12.35	111.09	55.54	55.55
Woodstock.....	9.94	.99	8.95	4.48	4.47
Total.....	\$741.51	\$74.15	\$667.36	\$333.69	\$333.67

## HILLSBOROUGH COUNTY.

*Statement*

Showing the receipts from May 1, 1910, to July 15, 1910, inclusive, the amount of 10 per cent. reserved on account of expenses and rebates on surrendered licenses for the year ending April 30, 1911, the amount available for distribution July 15, 1910, and the amount paid each city, town, and county, on account of the year ending April 30, 1911.

Cities and Towns.	Receipts from May 1, 1910, to July 15, 1910, inclusive.	10 per cent. reserved.	Available for distribution, July 15, 1910.	Paid city or town, July 30, 1910.	Paid county of Hillsborough, July 30, 1910.
Bennington.....	\$1,560.00	\$156.00	\$1,404.00	\$702.00	\$702.00
Goffstown.....	10.00	1.00	9.00	4.50	4.50
Greenville.....	2,450.00	245.00	2,205.00	1,102.50	1,102.50
Hillsborough.....	10.00	1.00	9.00	4.50	4.50
Manchester.....	116,751.72	11,675.17	105,076.55	52,538.28	52,538.27
Milford.....	24.93	2.49	22.44	11.22	11.22
Nashua.....	41,111.22	4,111.12	37,000.10	18,500.05	18,500.05
New Boston.....	50.00	5.00	45.00	22.50	22.50
Pelham.....	23.72	2.37	21.35	10.68	10.67
Peterborough.....	25.00	2.50	22.50	11.25	11.25
Wilton.....	10.00	1.00	9.00	4.50	4.50
Total.....	\$162,026.59	\$16,202.65	\$145,823.94	\$72,911.98	\$72,911.96

MERRIMACK COUNTY.

*Statement*

Showing the receipts from May 1, 1910, to July 15, 1910, inclusive, the amount of 10 per cent. reserved on account of expenses and rebates on surrendered licenses for the year ending April 30, 1911, the amount available for distribution July 15, 1910, and the amount paid each city, town, and county, on account of the year ending April 30, 1911.

Cities and Towns.	Receipts from May 1, 1910, to July 15, 1910, inclusive.	10 per cent. reserved.	Available for distribution, July 15, 1910.	Paid city or town, July 30, 1910.	Paid county of Merrimack, July 30, 1910.
Allentown.....	\$1,232.53	\$123.25	\$1,109.28	\$554.64	\$554.64
Andover.....	250.00	25.00	225.00	112.50	112.50
Concord.....	509.43	50.94	458.49	229.25	229.24
Franklin.....	164.94	16.50	148.44	74.22	74.22
Henniker.....	55.56	5.56	50.00	25.00	25.00
Hooksett.....	1,540.60	154.06	1,386.54	693.27	693.27
New London.....	10.00	1.00	9.00	4.50	4.50
Pembroke.....	3,075.94	307.59	2,768.35	1,384.18	1,384.17
Pittsfield.....	10.00	1.00	9.00	4.50	4.50
Total.....	\$6,849.00	\$684.90	\$6,164.10	\$3,082.06	\$3,082.04



## ROCKINGHAM COUNTY.

*Statement*

Showing the receipts from May 1, 1910, to July 15, 1910, inclusive, the amount of 10 per cent. reserved on account of expenses and rebates on surrendered licenses for the year ending April 30, 1911, the amount available for distribution July 15, 1910, and the amount paid each city, town and county, on account of the year ending April 30, 1911.

Cities and Towns.	Receipts from May 1, 1910, to July 15, 1910, inclusive.	10 per cent. reserved.	Available for distribution, July 15, 1910.	Paid city or town, July 30, 1910.	Paid county of Rockingham, July 30, 1910.
Derry.....	\$1,600.00	\$160.00	\$1,440.00	\$720.00	\$720.00
Epping.....	1,550.00	155.00	1,395.00	697.50	697.50
Exeter.....	140.00	14.00	126.00	63.00	63.00
Hampton.....	225.00	22.50	202.50	101.25	101.25
Kingston.....	200.00	20.00	180.00	90.00	90.00
Newcastle.....	86.11	8.61	77.50	38.75	38.75
Newfields.....	700.00	70.00	630.00	315.00	315.00
Newmarket.....	2,950.00	295.00	2,655.00	1,327.50	1,327.50
Northwood.....	23.72	2.37	21.35	10.68	10.67
Nottingham.....	250.00	25.00	225.00	112.50	112.50
Portsmouth.....	33,393.18	3,339.32	30,053.86	15,026.93	15,026.93
Raymond.....	10.00	1.00	9.00	4.50	4.50
Rye.....	111.94	11.19	100.75	50.38	50.37
Total.....	\$41,239.95	\$4,123.99	\$37,115.96	\$18,557.99	\$18,557.97

## STRAFFORD COUNTY.

*Statement*

Showing the receipts from May 1, 1910, to July 15, 1910 inclusive, the amount of 10 per cent. reserved on account of expenses and rebates on surrendered licenses for the year ending April 30, 1911, the amount available for distribution July 15, 1910, and the amount paid each city, town, and county, on account of the year ending April 30, 1911.

Cities and Towns.	Receipts from May 1, 1910, to July 15, 1910, inclusive.	10 per cent. reserved.	Available for distribution, July 15, 1910.	Paid city or town, July 30, 1910.	Paid county of Strafford, July 30, 1910.
Dover.....	\$23,619.23	\$2,361.92	\$21,257.31	\$10,628.66	\$10,628.65
Farmington.....	149.59	14.96	134.63	67.32	67.31
Milton.....	700.00	70.00	630.00	315.00	315.00
Rochester.....	1,205.00	120.50	1,084.50	542.25	542.25
Rollinsford.....	3,200.00	320.00	2,880.00	1,440.00	1,440.00
Somersworth.....	11,284.88	1,128.48	10,156.40	5,078.20	5,078.20
Total.....	\$40,158.70	\$4,015.86	\$36,142.84	\$18,071.43	\$18,071.41

## SULLIVAN COUNTY.

*Statement*

Showing the receipts from May 1, 1910, to July 15, 1910, inclusive, the amount of 10 per cent. reserved on account of expenses and rebates on surrendered licenses for the year ending April 30, 1911, the amount available for distribution July 15, 1910, and the amount paid each city, town, and county, on account of the year ending April 30, 1911.

Cities and Towns.	Receipts from May 1, 1910, to July 15, 1910, inclusive.	10 per cent. reserved.	Available for distribution, July 15, 1910.	Paid city or town, July 30, 1910.	Paid county of Sullivan, July 30, 1910.
Charlestown.....	\$9.73	\$0.97	\$8.76	\$4.38	\$4.38
Claremont.....	190.00	19.00	171.00	85.50	85.50
Croydon.....	50.00	5.00	45.00	22.50	22.50
Newport.....	10.00	1.00	9.00	4.50	4.50
Total.....	\$259.73	\$25.97	\$233.76	\$116.88	\$116.88

RECAPITULATION.

Counties.	Receipts from May 1, 1910, to July 15, 1910, inclusive, less rebates.	10 per cent. reserved.	Available for distribution, July 15, 1910.	Paid cities and towns, July 30, 1910.	Paid counties, July 30, 1910.
Belknap.....	\$629.87	\$62.99	\$566.88	\$274.06	\$292.82
Carroll.....	475.43	47.54	427.89	204.57	223.32
Cheshire.....	1,423.01	142.30	1,280.71	640.36	640.35
Coos.....	5,963.22	596.32	5,366.90	2,683.45	2,683.45
Grafton.....	741.51	74.15	667.36	333.69	333.67
Hillsborough.....	162,026.59	16,202.65	145,823.94	72,911.98	72,911.96
Merrimack.....	6,849.00	684.90	6,164.10	3,082.06	3,082.04
Rockingham.....	41,239.95	4,123.99	37,115.96	18,557.99	18,557.97
Strafford.....	40,158.70	4,015.86	36,142.84	18,071.43	18,071.41
Sullivan.....	259.73	25.97	233.76	116.88	116.88
Total.....	\$259,767.01	\$25,976.67	\$233,790.34	\$116,876.47	\$116,913.87
Amount paid cities and towns.....					116,876.47
Total.....					\$233,790.34

## STATEMENT

Showing the amount received from license fees, transfer fees and forfeitures, the total receipts, and amount of rebates paid on licenses surrendered, from July 16, 1910, to August 31, 1910, inclusive, on account of the year ending April 30, 1911.

Counties and Cities or Towns.	Amount received from			Total receipts.	Rebates paid.
	License fees.	Transfer fees.	Forfei- tures.		
Coos County:					
Whitefield.....	\$7.02	.....	.....	\$7.02	.....
Grafton County:					
Bethlehem.....	18.48	.....	.....	18.48	.....
Enfield.....		\$10.00	.....	10.00	.....
Hillsborough County:					
Manchester.....	304.31	20.00	.....	324.31	.....
Greenville.....	887.10	.....	.....	887.10	.....
Peterborough.....		10.00	.....	10.00	.....
Merrimack County:					
Henniker.....		10.00	.....	10.00	.....
Rockingham County:					
Rye.....	19.03	.....	.....	19.03	.....
Portsmouth.....		30.00	.....	30.00	.....
Strafford County:					
Somersworth.....	221.77	.....	.....	221.77	.....
Dover.....		.....	.....		*\$599.99
Sullivan County:					
Newport.....	45.06	.....	.....	45.06	.....
Total.....	†\$1,502.77	†\$80.00	.....	\$1,582.77	\$599.99

\* See Table No. 2, page 2.

† See Table No. 3, page 3.

# NUMBER OF LICENSES GRANTED

For the year ending April 30, 1910.

(License year 1909-1910.)

## BELKNAP COUNTY.

Cities and Towns.	Number of licenses granted.									Total.	Amount of fees received.
	Class.										
	1	2	3	4	5	6	7	8	9		
Barnstead.....	1		1							2	\$300.00
Belmont.....	1									1	23.39
Center Harbor.....	1									1	23.46
Laconia.....	5				5					10	437.47
*Lake Winnepesaukee.....						1				1	20.84
Meredith.....					2					2	20.00
Tilton.....					3					3	30.00
Total.....	8		1		10	1				20	\$855.16

\* License exercised upon the waters of Lake Winnepesaukee in the counties of Belknap and Carroll, and not in any town in said counties. (See Carroll County.)



## NUMBER OF LICENSES GRANTED

For the year ending April 30, 1910.

(License year 1909-1910.)

## CARROLL COUNTY.

Cities and Towns.	Number of licenses granted.										Total.	Amount of fees received.
	Class.											
	1	2	3	4	5	6	7	8	9			
Conway.....	2										2	\$91.67
Jackson.....	1										1	42.64
*Lake Winnepesaukee.....						1					1	20.83
Ossipee.....	2										2	49.33
Wakefield.....	2				1	1					4	130.70
Wolfeboro.....	2				1						3	73.98
Total.....	9				2	2					13	\$409.15

\* See footnote, Belknap County.

NUMBER OF LICENSES GRANTED

For the year ending April 30, 1910.

(License year 1909-1910.)

CHESHIRE COUNTY.

Cities and Towns.	Number of licenses granted.										Amount of fees received.	
	Class.											Total.
	1	2	3	4	5	6	7	8	9			
Alstead.....	1		1		1						3	\$971.16
Chesterfield.....	3										3	90.21
Hinsdale.....	1				2						3	92.98
Keene.....	2										2	225.54
Walpole.....	1				1						2	58.69
Winchester.....	1				1						1	10.00
Total.....	8		1		5						14	\$1,448.58

## NUMBER OF LICENSES GRANTED

For the year ending April 30, 1910.

(License year 1909-1910.)

## COOS COUNTY.

Cities and Towns.	Number of licenses granted.									Total.	Amount of fees received.
	Class.										
	1	2	3	4	5	6	7	8	9		
Berlin . . . . .	2				2					4	\$219.10
Carroll . . . . .	6									6	589.79
Colebrook . . . . .	2									2	87.51
Gorham . . . . .	2	2	1		2					7	3,891.94
Jefferson . . . . .	1				1					2	52.78
Lancaster . . . . .	2				1					3	135.00
Northumberland . . . . .	2				1					3	144.17
Stewartstown . . . . .	1				1					2	228.47
Stratford . . . . .	1									1	29.17
Whitefield . . . . .	1									1	47.58
Total . . . . .	20	2	1		8					31	\$5,425.51

# NUMBER OF LICENSES GRANTED

For the year ending April 30, 1910.

(License year 1909-1910.)

## GRAFTON COUNTY.

Cities and Towns.	Number of licenses granted.									Total.	Amount of fees received.
	Class.										
	1	2	3	4	5	6	7	8	9		
Ashland.....					2					2	\$20.00
Benton.....	1									1	20.77
Bethlehem.....	2				1					3	72.42
Bristol.....	1				1					2	53.48
Canaan.....					2					2	16.43
Enfield.....	1				1					2	35.00
Franconia.....	2									2	86.96
Haverhill.....	1				2					3	111.34
Holderness.....	1									1	18.88
Lebanon.....					3					3	30.00
Lisbon.....	1				2					3	70.00
Littleton.....	1				3					4	80.00
Plymouth.....	1				3	1				5	130.00
Woodstock.....					1					1	9.39
Total.....	12				21	1				34	\$754.67

## NUMBER OF LICENSES GRANTED

For the year ending April 30, 1910.

(License year 1909-1910.)

## HILLSBOROUGH COUNTY.

Cities and Towns.	Number of licenses granted.										Total.	Amount of fees received.
	Class.											
	1	2	3	4	5	6	7	8	9			
Bennington.....	1	2	.....	.....	.....	.....	.....	.....	.....	3	\$1,496.67	
Goffstown.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	10.00	
Greenville.....	1	2	.....	.....	2	.....	.....	.....	.....	5	2,797.58	
Hillsborough.....	.....	.....	.....	.....	2	.....	.....	.....	.....	2	19.84	
Manchester.....	6	75	20	1	36	.....	8	1	.....	147	113,770.94	
Milford.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	17.95	
Nashua.....	9	41	11	.....	6	1	.....	.....	.....	68	43,492.09	
New Boston.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	48.52	
Pelham.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	24.87	
Peterborough.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	24.33	
Wilton.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	10.00	
Total.....	21	120	31	1	48	1	8	1	.....	231	\$161,712.79	

# NUMBER OF LICENSES GRANTED

For the year ending April 30, 1910.

(License year 1909-1910.)

## MERRIMACK COUNTY.

Cities and Towns.	Number of licenses granted.									Total.	Amount of fees received.
	Class.										
	1	2	3	4	5	6	7	8	9		
Allenstown.....		7								7	\$1,549.85
Andover.....	1		1							2	250.00
Concord.....	5				6					11	623.88
Franklin.....	1				5					6	151.48
Henniker.....					1					1	10.00
Hooksett.....	1	2								3	850.00
New London.....					1					1	10.00
Pembroke.....	1	8	4		2					15	3,091.25
Pittsfield.....					1					1	10.00
Total.....	9	17	5		16					47	\$6,546.46



## NUMBER OF LICENSES GRANTED

For the year ending April 30, 1910.

(License year 1909-1910.)

## ROCKINGHAM COUNTY.

Cities and Towns.	Number of licenses granted.									Total.	Amount of fees received.
	Class.										
	1	2	3	4	5	6	7	8	9		
Derry.....	2	3	1	.....	2	.....	.....	.....	.....	8	\$1,528.22
Epping.....	1	1	.....	.....	1	.....	.....	.....	.....	3	1,550.00
Exeter.....	1	.....	.....	.....	4	.....	.....	.....	.....	5	140.00
Hampton.....	3	3	.....	.....	1	.....	.....	.....	.....	4	335.00
Kingston.....	1	.....	1	.....	.....	.....	.....	.....	.....	2	200.00
Newcastle.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	44.73
Newfields.....	.....	2	2	.....	.....	.....	.....	.....	.....	4	700.00
Newmarket.....	3	7	2	.....	1	.....	.....	.....	.....	13	3,067.74
Northwood.....	2	.....	.....	.....	.....	.....	.....	.....	.....	2	47.84
Nottingham.....	1	.....	1	.....	.....	.....	.....	.....	.....	2	250.00
Portsmouth.....	5	43	15	.....	5	1	.....	3	2	74	35,190.14
Raymond.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	10.00
Rye.....	2	.....	.....	.....	.....	.....	.....	.....	.....	2	66.12
Total.....	22	56	22	.....	15	1	.....	3	2	121	\$43,129.79

# NUMBER OF LICENSES GRANTED

For the year ending April 30, 1910.

(License year 1909-1910.)

## STRAFFORD COUNTY.

Cities and Towns.	Number of licenses granted.										Amount of fees received.
	Class.									Total.	
	1	2	3	4	5	6	7	8	9		
Dover.....	7	32	9		9					57	\$23,955.64
Farmington.....	2									2	146.37
Milton.....	3				2					5	909.65
Rochester.....	3				2					5	290.46
Rollinsford.....	1	5	3		1					10	3,150.00
Somersworth.....	2	22	5		3					32	10,547.85
Total.....	18	59	17		17					111	\$38,999.97

## NUMBER OF LICENSES GRANTED

For the year ending April 30, 1910.

(License year 1909-1910.)

## SULLIVAN COUNTY.

Cities and Towns.	Number of licenses granted.									Total.	Amount of fees received.
	Class.										
	1	2	3	4	5	6	7	8	9		
Charlestown.....					1					1	\$8.94
Claremont.....	1				4					5	189.84
Croydon.....	1									1	50.00
Newport.....					2					2	18.12
Total.....	2				7					9	\$266.90

# NUMBER OF LICENSES GRANTED

For the year ending April 30, 1910.

(License year 1909-1910.)

## RECAPITULATION.

Counties.	Number of licenses granted.									Total.	Amount of fees received.
	Class.										
	1	2	3	4	5	6	7	8	9		
Belknap.....	8	....	1	....	10	1	....	....	....	20	\$855.16
Carroll.....	9	....	....	....	2	2	....	....	....	13	409.15
Cheshire.....	8	....	1	....	5	....	....	....	....	14	1,448.58
Coos.....	20	2	1	....	8	....	....	....	....	31	5,425.51
Grafton.....	12	....	....	....	21	1	....	....	....	34	754.67
Hillsborough.....	21	120	31	1	48	1	8	1	....	231	161,712.79
Merrimack.....	9	17	5	....	16	....	....	....	....	47	6,546.46
Rockingham.....	22	56	22	....	15	1	....	3	2	121	43,129.79
Strafford.....	18	59	17	....	17	....	....	....	....	111	38,999.97
Sullivan.....	2	....	....	....	7	....	....	....	....	9	266.90
Total.....	129	254	78	1	149	6	8	4	2	631	\$259,548.98

\* One sixth-class license exercised upon the waters of Lake Winnepesaukee in the counties of Belknap and Carroll, and tabulated in both of said counties. Total number of sixth-class licenses granted, 5; total number of all classes, 630.

TABLE

Showing, by counties, the amount of fees received from each class of licenses, for the year ending April 30, 1910.

Counties.	Class.									Total.
	1	2	3	4	5	6	7	8	9	
Belknap.....	\$634.69		\$100.00		\$99.63	\$20.84				\$855.16
Carroll.....	322.62				20.00	66.53				409.15
Cheshire.....	588.73		748.38		111.47					1,448.58
Coos.....	2,000.35	\$2,400.00	800.00		225.16					5,425.51
Grafton.....	498.98				205.69	50.00				754.67
Hillsborough.....	9,585.36	124,564.48	22,561.29	\$600.00	2,126.66	75.00	\$1,200.00	\$1,000.00		161,712.79
Merrimack.....	1,210.36	4,449.85	646.25		240.00					6,546.46
Rockingham.....	4,433.69	28,438.52	5,347.58		510.00	100.00		4,000.00	\$300.00	43,129.79
Straford.....	3,752.54	30,478.49	4,000.00		768.94					38,999.97
Sullivan.....	200.00				66.90					266.90
Total.....	\$23,227.32	\$190,331.34	\$34,203.50	\$600.00	\$4,374.45	\$312.37	\$1,200.00	\$5,000.00	\$300.00	\$259,548.98

# NUMBER OF LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## BELKNAP COUNTY.

Cities and Towns.	Number of licenses granted.									Total.	Amount of fees received.
	Class.										
	1	2	3	4	5	6	7	8	9		
Barnstead.....			1							1	\$99.46
Belmont.....	1				1					2	32.25
Center Harbor.....	1									1	47.45
Laconia.....	3				4					7	389.87
*Lake Winnepesaukee.....						1				1	20.84
Meredith.....					1					1	10.00
Tilton.....					3					3	30.00
Total.....	5		1		9	1				16	\$629.87

\*License exercised upon the waters of Lake Winnepesaukee in the counties of Belknap and Carroll, and not in any town in said counties. (See Carroll County.)



## NUMBER OF LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## CARROLL COUNTY.

Cities and Towns.	Number of licenses granted.										Total.	Amount of fees received.
	Class.											
	1	2	3	4	5	6	7	8	9			
Conway.....	2										2	\$115.73
Jackson.....	1										1	39.79
*Lake Winnepesaukee.....						1					1	20.83
Ossipee.....	2										2	75.00
Wakefield.....	1				1	1					3	104.59
Wolfeboro.....	2				2						4	119.49
Total.....	8				3	2					13	\$475.43

\*See footnote, Belknap County.

# NUMBER OF LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## CHESHIRE COUNTY.

Cities and Towns.	Number of licenses granted.										Amount of fees received.
	Class.									Total.	
	1	2	3	4	5	6	7	8	9		
Alstead.....	1		1							2	\$950.00
Chesterfield.....	3									3	108.82
Dublin.....	1									1	19.89
Hinsdale.....	1				1					2	85.00
Keene.....	2									2	250.00
Winchester.....					1					1	9.30
Total.....	8		1		2					11	\$1,423.01

## NUMBER OF LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## COOS COUNTY.

Cities and Towns.	Number of licenses granted.									Amount of fees received.	
	Class.										Total.
	1	2	3	4	5	6	7	8	9		
Berlin .....	4				3					7	\$478.92
Carroll .....	6									6	583.36
Colebrook .....	2				1					3	109.87
Errol .....	1									1	43.76
Gorham .....	2	2	1		2					7	3,900.00
Jefferson .....	1				1					2	52.51
Lancaster .....	2				1					3	135.00
Northumberland .....	2				1					3	210.00
Stewartstown .....	1				1					2	225.00
Stratford .....	1									1	50.00
Whitefield .....	1				1					2	51.61
Total .....	23	2	1		11					37	\$5,840.03

## NUMBER OF LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## GRAFTON COUNTY.

Cities and Towns.	Number of licenses granted.									Total.	Amount of fees received.
	Class.										
	1	2	3	4	5	6	7	8	9		
Ashland.....	1				2					3	\$66.44
Bethlehem.....	3				1					4	117.47
Bristol.....	1				1					2	60.00
Canaan.....					1					1	10.00
Enfield.....	1				1					2	34.93
Franconia.....	1									1	48.79
Haverhill.....	1				2					3	109.17
Lebanon.....					3					3	29.94
Lisbon.....	1				2					3	70.00
Littleton.....	1				3					4	79.87
Plymouth.....	1				3	1				5	123.44
Woodstock.....					1					1	9.94
Total.....	11				20	1				32	\$759.99

## NUMBER OF LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## HILLSBOROUGH COUNTY.

Cities and Towns.	Number of licenses granted.										Total.	Amount of fees received.
	Class.											
	1	2	3	4	5	6	7	8	9			
Bennington.....	1	2									3	\$1,560.00
Goffstown.....					1						1	10.00
Greenville.....		3			1						4	3,337.10
Hillsborough.....					1				1		1	10.00
Manchester.....	6	75	19	1	31		8	1	1	142	114,366.24	
Milford.....	1									1	24.93	
Nashua.....	8	37	11		5	1				62	41,101.22	
New Boston.....	1									1	50.00	
Pelham.....	1									1	23.72	
Peterborough.....	1									1	25.00	
Wilton.....					1					1	10.00	
Total.....	19	117	30	1	40	1	8	1	1	218	\$160,518.21	

# NUMBER OF LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## MERRIMACK COUNTY.

Cities and Towns.	Number of licenses granted.									Total.	Amount of fees received.
	Class.										
	1	2	3	4	5	6	7	8	9		
Allentown.....		5								5	\$1,232.53
Andover.....	1		1							2	250.00
Concord.....	4				5					9	509.43
Franklin.....	1				4					5	164.94
Henniker.....	1				1					2	55.56
Hooksett.....	1	2								3	840.60
New London.....	1				1					1	10.00
Pembroke.....		8	4		2					14	3,075.94
Pittsfield.....					1					1	10.00
Total.....	8	15	5		14					42	\$6,149.00



## NUMBER OF LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## ROCKINGHAM COUNTY.

Cities and Towns.	Number of licenses granted.									Total.	Amount of fees received.
	Class.										
	1	2	3	4	5	6	7	8	9		
Derry.....	2	3	1		2					8	\$1,600.00
Epping.....	1	1			1					3	1,550.00
Exeter.....	1				4					5	140.00
Hampton.....	2									2	225.00
Kingston.....	1		1							2	200.00
Newcastle.....	1									1	86.11
Newfields.....		2	2							4	700.00
Newmarket.....	3	7	1		1					12	2,950.00
Northwood.....	1									1	23.72
Nottingham.....	1		1							2	250.00
Portsmouth.....	5	36	18		5	1		3		68	33,373.18
Raymond.....					1					1	10.00
Rye.....	3									3	130.97
Total.....	21	49	24		14	1		3		112	\$41,238.98

# NUMBER OF LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## STRAFFORD COUNTY.

Cities and Towns.	Number of licenses granted.									Total.	Amount of fees received.
	Class.										
	1	2	3	4	5	6	7	8	9		
Dover.....	8	32	10		9					59	\$24,219.22
Farmington.....	2									2	149.59
Milton.....	2				2					4	700.00
Rochester.....	3				2					5	395.00
Rollinsford.....	1	5	3		2					11	3,200.00
Somersworth.....	2	22	5		1					30	10,206.65
Total.....	18	59	18		16					111	\$38,870.46

## NUMBER OF LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## SULLIVAN COUNTY.

Cities and Towns.	Number of licenses granted.									Amount of fees received.	
	Class.										Total.
	1	2	3	4	5	6	7	8	9		
Charlestown.....	1				1					1	\$9.73
Claremont.....	1				4					5	190.00
Croydon.....	1									1	50.00
Newport.....	1				2					3	55.06
Total.....	3				7					10	\$304.79

# NUMBER OF LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## RECAPITULATION.

Counties.	Number of licenses granted.									Total.	Amount of fees received.
	Class.										
	1	2	3	4	5	6	7	8	9		
*Belknap.....	5		1		9	1				16	\$629.87
*Carroll.....	8				3	2				13	475.43
Cheshire.....	8		1		2					11	1,423.01
Coos.....	23	2	1		11					37	5,840.03
Grafton.....	11				20	1				32	759.99
Hillsborough.....	19	117	30	1	40	1	8	1	1	218	160,518.21
Merrimack.....	8	15	5		14					42	6,149.00
Rockingham.....	21	49	24		14	1		3		112	41,238.98
Strafford.....	18	59	18		16					111	38,870.46
Sullivan.....	3				7					10	304.79
Total.....	124	242	80	1	136	6	8	4	1	602	\$256,209.77

\* One sixth-class license exercised upon the waters of Lake Winnepesaukee in the counties of Belknap and Carroll, and tabulated in both of said counties Total number of sixth-class licenses granted, 5; total number of all classes, 601.

## NUMBER OF LICENSES GRANTED EACH YEAR.

License Year.	Number of licenses granted.										Amount of fees received.
	Class.									Total.	
	1	2	3	4	5	6	7	8	9		
1903-1904.....	231	373	212	13	234	*9	9	5	....	*1,086	\$340,505.29
1904-1905.....	217	380	192	5	217	*10	12	5	....	*1,038	388,257.34
1905-1906.....	176	354	151	2	209	*7	10	5	2	*916	377,692.00
1906-1907.....	170	339	140	1	199	*7	11	5	2	*874	367,262.91
1907-1908.....	140	272	100	2	186	*7	10	4	2	*723	305,408.96
1908-1909.....	139	264	102	1	154	*6	9	4	1	*680	285,386.92
1909-1910.....	129	254	78	1	149	*5	8	4	2	*630	259,548.98
May 1-August 31, 1910.....	124	242	80	1	136	*5	8	4	1	*601	256,209.77

\* One sixth-class license exercised upon the waters of Lake Winnepesaukee in the counties of Belknap and Carroll, and tabulated in both of said counties.

# LICENSES GRANTED

From September 1, 1909, to April 30, 1910, inclusive.

(License year 1909-1910.)

Name of Licensee.	Street and Number.	Class.
ALLENSTOWN.		
Ernest Lemaire.....	Main & Depot Streets.....	2
BERLIN.		
Miles J. Mullen.....	51 Main Street.....	5
George Treggett.....	489 Main Street.....	5
LACONIA.		
Herbert H. Caldon.....	Mount Belknap House.....	1
MANCHESTER.		
Zephirin Provencher.....	2 & 8 Amory Street.....	5
Patrick J. Morrissey.....	Paragon Hotel.....	1
NASHUA.		
Alix Degasis.....	9 School Street.....	2
Joseph Buboia, Jr.....	159 West Pearl Street.....	2
Alphonse Boisvert.....	42 1-2 Canal Street.....	2
PEMBROKE.		
Edgard Lavallee.....	33 Glass Street.....	3
Carroll & Cass.....	Osgood Inn.....	1
PORTSMOUTH.		
Leslie W. Thompson.....	54 Market Street.....	2
Clarence H. Paul.....	11 Ladd Street.....	2
Morgan S. Dada.....	5 High Street.....	9
Morgan S. Dada.....	9 High Street.....	2
Patrick O'Leary.....	23 Daniel Street.....	2
STRATFORD.		
Charles H. Minchen.....	Hotel Atkinson.....	1
WOLFEBORO.		
Michael Cronin.....	Hotel Elmwood.....	1



## LICENSES TRANSFERRED

From September 1, 1909, to April 30, 1910, inclusive.

(License year 1909-1910.)

Showing the present holder and location where exercised,  
and the licensee from whom, or location from which,  
transferred.

Name of Licensee.	Street and Number.	Class.
ALLENSTOWN.		
Fred Courtemanche.....	Main and Depot Streets.....	2
Transferred from Dazile Lefebvre.		
*Fred Courtemanche.....	Main and Depot Streets.....	2
Transferred to 17 Hayes Opera House Block.		
Zephirin H. Leblanc.....	Ferry Street.....	2
Transferred from Cleophas Dube.		
CONCORD.		
Matson Brothers.....	Commercial House.....	1
Transferred from John M. Bonnyman.		
CLAREMONT.		
Edward J. Hendee.....	Hotel Claremont.....	1
Transferred from Alphonso C. Brooks.		
DERRY.		
Waterman & Moncrieff.....	Hotel Bradford.....	1
Transferred from Ralph Thyng.		
DOVER.		
Peter Loughlin.....	5 Waldron Street.....	2
Transferred from No. 5 to No. 3 Waldron Street.		
Albert Marcotte.....	473 Central Avenue.....	2
Transferred from Wilbur F. Moody.		
EXETER.		
A. H. Reed & Co.....	The Squamscott.....	1
Transferred from William R. Bucknam.		
MANCHESTER.		
James Goonan.....	32 Lake Avenue.....	2
Transferred from Goonan & McLoughlin.		
Gleason & Ferson.....	29 South Main Street.....	2
Transferred from Herman Rodelsperger.		

LICENSES TRANSFERRED.—*Concluded.*

Name of Licensee.	Street and Number.	Class.
NASHUA.		
Pierre P. Lemieux.....	44 Canal Street.....	3
Transferred from Boisvert & Co.		
William Corosa.....	23 High Street.....	2
Transferred from Anthony Uzdou.		
William Corosa.....	23 1-2 High Street.....	2
Transferred from Anthony Uzdou.		
John Winn.....	12 West Hollis Street.....	2
Transferred from Winn & Lee.		
Gravelle & Co.....	11 Ledge Street.....	2
Transferred from George Gravelle, Jr.		
Horace J. Belair.....	136 West Pearl Street.....	2
Transferred from Philip Belair.		
Michael Sullivan.....	6 High Street.....	2
Transferred from 6 High to 10 High Street.		
NEWFIELDS.		
Alfred Conner.....	Foundry Street.....	2
Transferred from William H. Conner.		
Alfred Conner.....	Pease Place.....	3
Transferred from William H. Conner.		
PORTSMOUTH.		
Joseph Hett.....	33 & 35 Penhallow Street.....	3
Transferred from Charles E. Lear & Company.		
Thomas McKenna.....	39 Bridge Street.....	2
Transferred from Alexander Frazier.		
SOMERSWORTH.		
Esdras Poulin.....	Great Falls Hotel.....	1
Transferred from Sidney F. Greenwood.		
Peter Marquis.....	39 Washington Street.....	2
Transferred from Albert Gaudett.		
Frank E. Hobbs.....	33 Main Street.....	2
Transferred from Cochecho Bottling Company.		
Frank E. Hobbs.....	33 Main Street.....	3
Transferred from Cochecho Bottling Company.		

\* Second transfer of this license.

## LICENSES REVOKED

From September 1, 1909, to April 30, 1910, inclusive.

(License year 1909-1910.)

Name of Licensee.	Street and Number.	Class.
HOOKSETT.		
William H. Hurd.....	Riverside Inn.....	1
LACONIA.		
J. Alonzo Greene.....	Hotel Weirs, Weirs.....	1
MANCHESTER.		
Dante Smith.....	1277 Elm Street.....	5
NASHUA.		
Joseph Salvail.....	159 West Pearl Street.....	2
PORTSMOUTH.		
Denis D. Burke.....	6 Vaughan Street.....	2
Maurice M. O'Leary.....	23 Daniel Street.....	2
Daniel J. Regan.....	11 Ladd Street.....	2
Walter S. Cummings.....	National Hotel.....	1
Edmund Brown.....	116 Islington Street.....	2
WALPOLE.		
George S. Sherman.....	Hotel Wentworth.....	1

## LICENSES SURRENDERED

From September 1, 1909, to April 30, 1910, inclusive.

(License year 1909-1910. Licensee deceased.)

Name of Licensee.	Street and Number.	Class.
ALLENSTOWN.		
Joseph Fraser.....	17 Hayes' Opera House Block.....	2
CONCORD.		
Mary Brogini.....	New American House.....	1

# LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## BELKNAP COUNTY.

Name of Licensee.	Street and Number.	Class.
BARNSTEAD.		
Geo. M. Leavitt.....	Depot Street.....	3
BELMONT.		
Joseph P. Currier.....	Currier's Hotel.....	1
Edwin C. Bean.....	Main Street.....	5
CENTER HARBOR.		
William A. Maclean.....	The Colonial.....	1
LACONIA.		
Lyman B. Woodman.....	The Eagle Hotel.....	1
Frank O. Wallace.....	New City Hotel.....	1
Geo. A. Quimby.....	522 Main Street.....	5
James H. Story.....	528 Main Street.....	5
Herbert H. Caldon.....	Mt. Belknap House.....	1
Geo. A. Collins.....	57-59 Elm Street.....	5
Clarence W. Plummer.....	787 Union Avenue.....	5
MEREDITH.		
C. W. Morrison.....	87 Main Street.....	5
TILTON.		
George W. Lord.....	Main Street.....	5
Frank R. French.....	Main Street.....	5
Chas. P. Herrick.....	Main Street.....	5

## LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## BELKNAP AND CARROLL COUNTIES.

Name of Licensee.	Street and Number.	Class.
Boston & Maine Railroad (a).....	Steamer Mount Washington.....	6

(a) License exercised upon the waters of Lake Winnepesaukee in the counties of Belknap and Carroll.

LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

CARROLL COUNTY.

Name of Licensee.	Street and Number.	Class.
CONWAY.		
Harry H. Randall.....	Hotel Randall.....	1
Kearsarge Hotel Company.....	Kearsarge House.....	1
JACKSON.		
Marshall C. Wentworth.....	Wentworth Hall.....	1
OSSIPEE.		
Willie N. Connor.....	West Ossipee House.....	1
Carroll Inn Company.....	Carroll Inn.....	1
WAKEFIELD.		
Wilbert S. Davis.....	Main & High Streets, Sanbornville.....	5
Crosby B. Remick.....	Sanborn House, Sanbornville.....	1
G. W. Armstrong Co.....	B. & M. Station, Sanbornville.....	6
WOLFEBORO.		
Michael Cronin.....	Hotel Elmwood.....	1
William E. Wiggin.....	Sheridan House.....	1
Joseph W. Robins.....	Railroad Avenue.....	5
Harry C. McFadden.....	South Main Street.....	5



## LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## CHESHIRE COUNTY.

Name of Licensee.	Street and Number.	Class.
ALSTEAD.		
Thomas Bushway, Jr. ....		3
Herbert B. Chapin. ....	Hotel Alstead. ....	1
CHESTERFIELD.		
John Corkery. ....	Spofford House. ....	1
Wallace K. Ware. ....	Lakeside House. ....	1
James H. Stearns. ....	Pine Grove Springs Hotel. ....	1
DUBLIN.		
Clesson E. Gowing. ....	Wilcox Inn. ....	1
HINSDALE.		
Ferrin & Holland. ....	Hotel Ashuelot. ....	1
Mark S. Mann. ....	Main Street. ....	5
KEENE.		
Judson A. Reynolds. ....	Cheshire House. ....	1
Alexander D. Grant. ....	109 Main Street. ....	1
WINCHESTER.		
Harry B. Buxton. ....	Main and Elm Streets. ....	5

# LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## COOS COUNTY.

Name of Licensee.	Street and Number.	Class.
BERLIN.		
Frank E. Farwell.....	Berlin House.....	1
George Treggett.....	480 Main Street.....	5
Miles J. Mullen.....	51 Main Street.....	5
Foss T. McNally.....	New Revere House.....	1
Trafton & Hinchey.....	Central House.....	1
William A. Farr.....	Commercial House.....	1
L. J. Cote.....	101 Main Street.....	5
CARROLL.		
The Bretton Woods Company.....	The Mount Washington.....	1
The Bretton Woods Company.....	The Mount Pleasant House.....	1
The Barron, Merrill and Barron Co.....	The Fabyan House.....	1
The Barron, Merrill and Barron Co.....	The Twin Mountain House.....	1
The Barron, Merrill and Barron Co.....	The Crawford House.....	1
J. Alfred Seymour.....	White Mountain House.....	1
COLEBROOK.		
Joseph T. Piper.....	Monadnock House.....	1
Charles E. Hartshorn.....	The New Colebrook House.....	1
George W. Dickson.....	Main Street.....	5
ERROL.		
Nathaniel R. Leach.....	Umbagog House.....	1
GORHAM.		
William D. Morse.....	Androscoggin Street.....	2
Joseph St. Clair.....	Washington Street.....	3
Edward Gosselin.....	Hotel Lafayette.....	1
Chas. A. Chandler.....	Mount Madison House.....	1
Chas. A. Chandler.....	Androscoggin Street.....	2
Fred W. Noyes.....	Exchange & Railroad.....	5
Ensign H. Barrett.....	Main Street.....	5
JEFFERSON.		
Chester A. Bates.....	Jefferson Pharmacy.....	5
Manasah Perkins.....	The Waumbek.....	1
LANCASTER.		
James L. Dow.....	51 Main Street.....	5
Geo. D. Marshall.....	Lancaster House.....	1
William C. Prouty.....	Mansion House.....	1

COOS COUNTY.—*Concluded.*

Name of Licensee.	Street and Number.	Class.
NORTHUMBERLAND.		
Frank W. Tibbetts.....	Groveton Tavern, Groveton.....	1
Ernest N. McConnell.....	Union House, Groveton.....	1
Wesley O. Emerson.....	(Groveton).....	5
STEWARTSTOWN.		
Lewis P. Merrill.....	.....	5
Brooks & Brown.....	.....	1
STRATFORD.		
Charles H. Minchen.....	Hotel Atkinson.....	1
WHITEFIELD.		
Charles E. Shaw.....	Fiske House.....	1
Daniel C. Woodman.....	Main Street.....	5

# LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## GRAFTON COUNTY.

Name of Licensee.	Street and Number.	Class.
ASHLAND.		
Bert P. Porter.....	Main Street.....	5
A. E. Porter & Son.....	Main Street.....	5
James M. Cotton.....	Squam Lake House.....	1
BETHLEHEM.		
Henry P. Smith.....	Main Street.....	5
The Maplewood Hotel Company.....	The Maplewood.....	1
The Sinclair Hotel Company.....	The Sinclair Hotel.....	1
William S. Dunham.....	Alpine House.....	1
BRISTOL.		
George H. Fowler.....	Central Square.....	5
George H. Calley.....	Hotel Bristol.....	1
CANAAN.		
Edwin M. Allen.....	Mechanic Street.....	5
ENFIELD.		
Frank B. Williams.....	Main Street.....	5
*Dana L. Young.....	Main Street (Webster House).....	1
FRANCONIA.		
Profile & Flume Hotels Company.....	Profile House.....	1
HAVERHILL.		
Ezra B. Mann.....	Court & Central Streets, Woodsville.....	5
Geo. H. Clark.....	Central Street, Woodsville.....	5
W. Fred Wormwood.....	Hotel Wentworth, Woodsville.....	1
LEBANON.		
Edgar S. Woodward.....	47 Hanover Street.....	5
Perley & McNeill.....	15 Hanover.....	5
Jay W. Kilton.....	29 Main Street (West Lebanon).....	5
LISBON.		
Harold C. Marston.....	School Street.....	5
Merrill & Bangs.....	Main Street.....	5
Truman W. Glover.....	Hotel Moulton.....	1

GRAFTON COUNTY.—*Concluded.*

Name of Licensee.	Street and Number.	Class.
LITTLETON.		
Fred C. Sheldon.....	Thayer's Hotel.....	1
Chas. F. Davis.....	12 Main Street.....	5
Fred E. Greene.....	128 Main Street.....	5
Minerva D. Robins.....	28 Main Street.....	5
PLYMOUTH.		
Josiah R. Elliott.....	Depot Street.....	6
Fred W. Brown.....	Main Street.....	5
William M. Peppard.....	1 Highland Street.....	5
Jonathan C. Peaslee.....	96 North Main Street.....	5
Ward B. Hutchins.....	Tyler House.....	1
WOODSTOCK.		
E. L. Putnam.....	Main Street, North Woodstock.....	5

# LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## HILLSBOROUGH COUNTY.

Name of Licensee.	Street and Number.	Class.
BENNINGTON.		
John N. Adams.....	Main Street.....	2
Fred Graves.....	Crystal Spring House.....	1
Calvin S. Brown.....	Main Street.....	2
GOFFSTOWN.		
Otis F. Sumner.....	Mast Street.....	5
GREENVILLE.		
Julien H. Martin.....	Main Street.....	2
Eugene J. Greenwood.....	Mill Street.....	2
Frank H. Whiting.....	Main Street.....	5
Frank Cournoyer.....	530 Main Street.....	2
HILLSBOROUGH.		
Chas. S. Perry.....	Main & School Streets.....	5
MANCHESTER.		
Edward W. Harrington.....	115 Nutfield Lane.....	2
Alonzo W. Glines.....	290 Hampshire Lane.....	2
Kearney Brothers.....	26 Lake Avenue.....	2
Geo. J. Malmborg.....	31 Amherst Street.....	2
Bernhard Wolf.....	124 School Street.....	2
Weber & Neumann.....	185 Second Street.....	2
Robert S. Schneider.....	40 Ferry Street.....	4
Robert S. Schneider.....	44 Ferry Street.....	3
John G. Holland.....	879 Elm Street.....	5
John G. Holland.....	893 Elm Street.....	5
Thomas Lord.....	New Manchester House.....	1
George Hossler.....	32 Manchester Street.....	3
Conrad Fiege.....	163 Douglas Street.....	2
Richards & Thornton.....	141-147 Nutfield Lane.....	2
Sullivan Bros. & Company.....	83 Amherst Street.....	2
Geo. H. Knowlton.....	744 Elm Street.....	5
John B. Varriek Company.....	809-813 Elm Street.....	5
Oscar L. Giguere.....	1023 Elm Street.....	5
Samuel J. Price.....	786 Elm Street.....	5
Eugene Quirin.....	517 North Main Street.....	3
Eugene Quirin.....	513 North Main Street.....	2
Reinhardt Hecker.....	197 Douglas Street.....	2
Chas. M. Hecker.....	104 South Main Street.....	2
Michael Connor.....	573 Elm Street.....	3
Michael Connor.....	569 Elm Street.....	2
Harry P. Ray.....	1204 Elm Street.....	2
Daniel A. Shannahan.....	38 Lake Avenue.....	2
Carl O. Anderson.....	28 Manchester Street.....	2
Pinard & Lussier.....	1159 Elm Street.....	2
John A. Collins.....	405 North Main Street.....	2
Marcin Pasciak.....	79 Amherst Street.....	2
*Demas Dwinell.....	621 Elm Street.....	2
James Goonan.....	32 Lake Avenue.....	2
Quirin Brothers.....	85 Manchester Street.....	2
Quirin Brothers.....	89 Manchester Street.....	3



HILLSBOROUGH COUNTY.—*Continued.*

Name of Licensee.	Street and Number.	Class.
MANCHESTER.— <i>Continued.</i>		
Joseph Bienvenue.....	49 Amherst Street.....	3
Joseph Bienvenue.....	47 Amherst Street.....	2
Joseph Masse.....	14 Concord Street.....	3
Joseph Masse.....	16 Concord Street.....	2
John Olesniewicz.....	61 Amherst Street.....	2
John Olesniewicz.....	57 Amherst Street.....	3
Dowd Brothers.....	39 Amherst Street.....	2
Dowd Brothers.....	41 Amherst Street.....	3
Joseph P. Chatel.....	43 Manchester Street.....	2
Joseph P. Chatel.....	37 Manchester Street.....	3
Patrick J. Flaherty.....	41 Central Street.....	2
Patrick J. Flaherty.....	45 Central Street.....	3
John A. Ballou.....	Hotel Milford.....	1
Schmidt & Schrepfer.....	15 Lake Avenue.....	2
Hohman & Bartlett.....	672 Elm Street.....	3
Augustus A. E. Brien.....	51 Bridge Street.....	5
Arthur Provost.....	36 Amory Street.....	2
Amasa D. Smith.....	142 Merrimack Street.....	5
Geo. P. Averill.....	34 & 36 Amherst Street.....	2
Christian L. Wolf.....	48 South Main Street.....	2
Wagner & Graupner.....	734 Elm Street.....	2
James H. Reynolds.....	1160 Elm Street.....	2
Eugene Sigrist.....	103 Manchester Street.....	2
Welcome Jencks.....	12 West Central Street.....	2
John J. O'Neill & Co.....	15 & 17 Concord Street.....	7
Workingmen's Relief Society.....	Douglas & West Streets.....	7
Beethoven Männerchor.....	48 Blaine Street.....	7
Manchester Turn Verein and Gymnastical School.....	265 Turner Street.....	7
*Noah H. Guay.....	19 Manchester Street.....	2
Harugari Club.....	232 Douglas Street.....	7
William White.....	18 Amory Street.....	2
William White.....	22 Amory Street.....	3
Beauchemin & Zing.....	1105 Elm Street.....	2
Edgar E. Castor.....	1331 Elm Street.....	5
M. J. Connor, Jr., & Co.....	21 Central Street.....	2
Connor & Murphy.....	19 South Main Street.....	2
Walter A. Chipman.....	797 Elm Street.....	5
True W. Jones Brewing Company.....	Hancock Street.....	8
Louis P. Lavoie.....	26 Marion Street.....	2
Michael F. Lawlor.....	51 Nutfield Lane.....	2
Charles E. Brady.....	75 Manchester Street.....	2
Melvin K. McLaughlin.....	69 Massabesic Street.....	5
Gesang Verein Männerchor.....	205 South Main Street.....	7
Laurent Roy.....	1151 Elm Street.....	2
Thomas F. Glancy.....	542 Elm Street.....	2
Jeremiah J. McCarthy.....	18 Amherst Street.....	2
Laforce & Baron.....	55 Amherst Street.....	2
Mahoney & Tierney.....	71 Lake Avenue.....	2
Clark & Flanagan.....	87 Central Street.....	2
Bodkin & Hartnett.....	238 Franklin Street.....	2
Ambrose Sweet.....	657 Elm Street.....	2
Martin E. Sullivan & Co.....	85 Lake Avenue.....	2
P. Harrington Sons.....	17 Lake Avenue.....	3
The Harrington Co.....	1225 Elm Street.....	2
The Harrington Co.....	1217 Elm Street.....	3
Alphonse Remillard.....	413 North Main Street.....	2
Manchester Hardware Co.....	936-940 Elm Street.....	5
James J. Kerwin.....	Lake Avenue & Chestnut Street.....	5
Joseph Dugre.....	617 Elm Street.....	2
John H. Conway.....	65 Central Street.....	2
Walsh & Hoyt.....	955 Elm Street.....	5
Joseph G. Plante & Co.....	635 Elm Street.....	2
Joseph G. Plante & Co.....	631 Elm Street.....	3

HILLSBOROUGH COUNTY.—Continued.

Name of Licensee.	Street and Number.	Class.
MANCHESTER.—Concluded.		
The Union Wine Company.....	760 Elm Street.....	3
Thomas H. Mahoney.....	81 Central Street.....	2
The Derryfield Club.....	Mechanic Street.....	7
Velere Desrochers.....	37 Marion Street.....	2
Joseph Gagnon.....	69 Manchester Street.....	2
Louis P. Chandonnet.....	28 Concord Street.....	2
Lewis G. Gilman.....	Lake Avenue & Hall Street.....	5
Club Jolliet.....	490 Chestnut Street.....	7
Owen Kenney, 2nd.....	72 Lake Avenue.....	2
J. Albert Marshall.....	24 South Main Street.....	5
Harry L. Knapp.....	58 West Central Street.....	2
Nelson G. VanDyke.....	20 Concord Street.....	2
Nelson G. VanDyke.....	24 Concord Street.....	3
*Gleason & Person.....	29 South Main Street.....	2
Denis A. Teehan.....	19 Granite Street.....	2
John H. Marshall.....	217 Lowell Street.....	5
LeBlanc & Simoneau.....	13 Concord Street.....	2
Jasinski & Co.....	77 Central Street.....	2
Albert J. Precourt.....	883 Elm Street.....	5
John P. Brown.....	Old City Hotel.....	1
Joseph A. Parr.....	110 Hanover Street.....	5
John Cullity.....	39 Central Street.....	3
*John T. & Peter Levasseur.....	106 McGregor Street.....	2
Levasseur Brothers.....	639 Elm Street.....	2
Selwin B. Wallace.....	Phenix Hotel.....	1
Zephirin Provencher.....	2 & 8 Amory Street.....	5
Zephirin Provencher.....	1231 Elm Street.....	5
Paul H. Boire.....	1029 Elm Street.....	5
Chadwick & Cashin.....	Hotel Webster.....	1
Patrick J. Morrissey.....	Paragon Hotel.....	1
George F. Soule.....	150 Bridge Street.....	5
Frank A. James.....	1213 Elm Street.....	5
Cercle National.....	Amory & McGregor Streets.....	7
Archie F. Precourt & Co.....	170 Wilson Street.....	5
Albert J. Precourt & Co.....	93 Central Street.....	5
Chas. G. Dunnington.....	375 Massabesic Street.....	5
Francis C. Miville.....	535 North Main Street.....	5
Cleon D. Tufts.....	1089 Elm Street.....	5
Matthew J. Dollard.....	44 Granite Street.....	2
Orrin W. Martin.....	20 Manchester Street.....	2
Napoleon J. Pichette.....	607 Elm Street.....	2
Herbert E. Dunnington.....	780-782 Elm Street.....	5
Sabin Noury.....	1167 Elm Street.....	5
Henry L. Jordan.....	19 Manchester Street.....	9

MILFORD.

Charles S. Willard.....	Hotel Howison.....	1
-------------------------	--------------------	---

NASHUA.

Nelson S. Whitman.....	175 Main Street.....	5
Michael H. O'Grady.....	1-3 Thayer's Court.....	3
Hallisey Drug Co.....	239 Main Street.....	5
Frank M. Eayrs.....	102 1-2 West Pearl Street.....	3
Daniel D. Readon.....	43 School Street.....	2
John A. Walcott.....	22 Factory Street.....	2
Joseph Labine.....	20 Ledge Street.....	2
Joseph Labine.....	20 Ledge Street.....	3
Prosper H. Charpentier.....	28 Chestnut Street.....	2
John J. McGlynn.....	10 School Street.....	3
John J. McGlynn.....	91 West Pearl Street.....	2
Joseph E. Dubois.....	32 Bridge Street.....	1
Graham & Bell.....	Tremont House.....	1

HILLSBOROUGH COUNTY.—*Concluded.*

Name of Licensee.	Street and Number.	Class.
NASHUA.— <i>Concluded.</i>		
Ernest F. Tessier.....	1 Elm Street.....	3
Fred W. Duval.....	2 Scripture Street.....	2
Beauchemin & Dionne.....	165 West Pearl Street.....	2
Alfred Laforme.....	66 1-2 West Hollis Street.....	2
James O'Neil.....	2 & 4 Water Street.....	2
Salvail & Avaré.....	40 1-2 Canal Street.....	2
Lavoie & Gagne.....	176 West Pearl Street.....	2
Sarah Connery.....	Union Hotel.....	1
John H. Field.....	22 High Street.....	3
George R. Boggis.....	1 Ledge Street.....	2
Andre Belanger.....	186 1-2 West Pearl Street.....	2
John B. Riendeau.....	56 Canal Street.....	2
Joseph Dubois, Jr.....	159 West Pearl Street.....	2
John Winn.....	12 West Hollis Street.....	2
Osias Charron.....	32 Chestnut Street.....	2
John J. Flood.....	122 East Hollis Street.....	3
Alphonse Boisvert.....	42 1-2 Canal Street.....	2
Pierre Lemieux.....	44 Canal Street.....	3
Michael Sinkewich.....	45 High Street.....	2
John D. Sullivan.....	28 Factory Street.....	2
John D. Sullivan.....	24 Factory Street.....	3
Phoebe P. Kingham.....	Laton House.....	1
James B. Hallisey.....	20 West Hollis Street.....	2
Darila Cardin.....	131 Temple Street.....	2
Albion L. Vining.....	77 West Pearl Street.....	2
Dennis O'Neil.....	Denton Hotel.....	1
John J. Welch.....	125 Temple Street.....	2
Michael Sullivan.....	10 High Street.....	2
Thomas P. Garrity.....	8-10 Factory Street.....	2
Geo. A. Lockwood.....	22 West Hollis Street.....	2
Joseph A. Bellavance.....	2 Canal Street.....	2
Horace J. Belair.....	136 West Pearl Street.....	2
Jcseph A. Bellavance.....	3 Canal Street.....	3
Austin E. Wallace.....	73 Main Street.....	5
Peter B. Bouchard.....	60 Canal Street.....	2
Charles E. Wright.....	Hotel Phoenix.....	1
Willis H. Blanchard.....	55 Main Street.....	5
Gravelle & Declos.....	11 Ledge Street.....	2
Michael H. O'Grady.....	Windsor Hotel.....	1
Joseph Kashulines.....	9 School Street.....	2
Jeremiah D. Hallisey.....	6 High Street.....	2
Thos. H. O'Connor.....	99 West Pearl Street.....	2
Frank H. Wingate.....	129 Main Street.....	5
William Corosa.....	23 High Street.....	2
William Corosa.....	23 1-2 High Street.....	3
G. W. Armstrong Co.....	B. & M. Station.....	6
Matilda Dubray.....	28 Amory Street.....	1
Thomas Backer.....	35 High Street.....	2
Gaffney & Bruen.....	137 West Pearl Street.....	2

## NEW BOSTON.

William P. Averill.....	The Tavern.....	1
-------------------------	-----------------	---

## PELHAM.

George G. Harris.....	Grand View House.....	1
-----------------------	-----------------------	---

## PETERBOROUGH.

*Geo. Samuel Tucker.....	Tuckers Tavern.....	1
--------------------------	---------------------	---

## WILTON.

William I. Durgin.....	Main Street.....	5
------------------------	------------------	---

# LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## MERRIMACK COUNTY.

Name of Licensee.	Street and Number.	Class.
ALLENSTOWN.		
Zephirin H. Leblanc.....	.....	2
Ernest Lemaire.....	Main & Depot Streets.....	2
Alfred W. Gilbert.....	Ferry Street.....	2
Eli Boisvert.....	11 Main Street.....	2
Hormidas Dube.....	Ferry Street.....	2
ANDOVER.		
Harley Hopkins.....	.....	3
Harley Hopkins.....	Hotel Potter.....	1
CONCORD.		
A. Perley Fitch.....	24-26 North Main Street.....	5
The Eagle and Phenix Hotel Company.....	108 North Main Street.....	1
Matson Brothers.....	143 North Main Street.....	1
Geo. H. Richardson.....	135 South Main Street.....	5
Chas. P. Coakley.....	Washington House, Penacook.....	1
Eugene Sullivan.....	1 North Main Street.....	5
Wynne Hazen Fowler.....	46 South Main Street, Penacook.....	5
Elmer C. Atwood.....	8 & 10 South Main Street, Penacook.....	5
John G. LaVally.....	Central House, Penacook.....	1
FRANKLIN.		
Edward B. Morse.....	362 Central Street.....	1
Rodney A. Griffin.....	334 Central Street.....	5
Charles L. Eddy.....	398 Central Street.....	5
Warren E. Gregory.....	Central Street.....	5
Edward L. Nelson.....	18 North Main Street.....	5
HENNIKER.		
Walter N. Whitney.....	Proctor Square.....	5
*Frank A. Hale.....	Hotel Henniker.....	1
HOOKSETT.		
Louis Arel.....	Main Street.....	2
Willie Arel.....	.....	2
James Thompson.....	Riverside Inn.....	1
NEW LONDON.		
Alfred B. Stimson.....	.....	5

MERRIMACK COUNTY.—*Concluded.*

Name of Licensee.	Street and Number.	Class.
PEMBROKE.		
Joseph Sansterre.....	Glass Street.....	2
Joseph Sansterre.....	Glass Street.....	3
James Gilbert.....	Glass & Church Streets.....	2
Edgard Lavallee.....	33 Glass Street.....	3
Edgard Lavallee.....	33 Glass Street.....	2
Geo. E. Gordon.....	Main Street.....	5
William J. Welch.....	Front & High Streets.....	2
Rainville & Diamond.....	10 Glass Street.....	2
John H. Rainville.....	Front Street.....	2
John H. Rainville.....	Front Street.....	3
Joseph P. Collins.....	Glass Street.....	2
Wilfred J. Parrent.....	Ottersons Block.....	5
Fearien Narcarm.....	Front Street.....	3
Fearien Narcarm.....	Front Street.....	2
PITTSFIELD.		
Geo. H. Colbath.....	Depot Street.....	5

# LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## ROCKINGHAM COUNTY.

Name of Licensee.	Street and Number.	Class.
DERRY.		
S. Howard Bell.....	12 East Broadway.....	5
Harry L. Benson.....	4 West Broadway.....	5
George Romprey.....	14 Central Street.....	2
Trudel and Bellavance.....	13 1-2 Central Street.....	3
Trudel and Bellavance.....	13 Central Street.....	2
Wynn Brothers.....	Railroad Avenue.....	2
Robert S. Elkins.....	Hotel Fenton.....	1
John W. Monerrieff.....	Hotel Bradford.....	1
EPPING.		
Moses A. Perkins.....	Main & Water Streets.....	1
Geo. A. Gilmore.....	413 Main Street.....	5
Bernard Bergeron.....	Brentwood Road.....	2
EXETER.		
Weeks & Seward.....	171 Water Street.....	5
Albert S. Wetherell.....	Front Street.....	5
Albert S. Wetherell.....	105 Water Street.....	5
A. H. Reed & Co.....	Squamscott Hotel.....	1
Clarence M. Collins.....	91 Water Street.....	5
HAMPTON.		
John G. Cutler.....	Sea View House.....	1
Otis H. Whittier.....	Hotel Whittier.....	1
KINGSTON.		
John H. Gannon.....	Main Street.....	3
John H. Gannon.....	The Kingston House.....	1
NEWCASTLE.		
Wentworth Hotel Company.....	Hotel Wentworth.....	1
NEWFIELDS.		
Alfred Conner.....	Main Street.....	3
Alfred Conner.....	Foundry Street.....	2
John Torrey.....	69 Pleasant Street.....	2
John Torrey.....	69 Pleasant Street.....	3



ROCKINGHAM COUNTY.—*Continued.*

Name of Licensee.	Street and Number.	Class.
NEWMARKET.		
George H. Willey.....	Main Street.....	1
George H. Willey.....	Main Street.....	3
Lewis E. Chase.....	Chase's Hotel.....	1
Joseph A. Filion.....	1 Central Street.....	2
Patrick Haley.....	14 Main Street.....	2
William E. Ritchie.....	The Ritchie Building.....	2
† Alexander Roberge.....	The Furber Place.....	2
Felix Sobozenski.....	72 Main Street.....	2
Jean Baptiste Laporte.....	22 Central Street.....	2
Charles H. Mathes.....	Main Street.....	2
Lewis E. Chase.....	Newmarket House.....	1
Alvah H. Place.....	Main Street.....	5
NORTHWOOD.		
Edson W. Tyler.....	Harvey House.....	1
NOTTINGHAM.		
Harvey T. Wyman.....	Rockingham House.....	1
Harvey T. Wyman.....	Road to Northwood, Nottingham Center ..	3
PORTSMOUTH.		
William Ward & Sons.....	93 Market Street.....	3
Boardman & Norton.....	17 Pleasant Street.....	5
Fred B. Coleman.....	61 Congress Street.....	5
Eldredge Brewing Company.....	24 Bow Street.....	8
Mitchell & Co.....	11 McDonough Street.....	2
Benjamin Green.....	1 Market Square.....	5
Charles E. Boynton.....	11 Bow Street.....	3
Joseph F. Lamb.....	27 Flint Street.....	2
John Kilroe & Co.....	3 Bartlett Street.....	2
Andrew O. S. Caswell.....	12 1-2 Porter Street.....	3
Morgan S. Dada.....	Hotel National.....	1
*Salvatore Corea.....	96 Market Street.....	2
Patrick J. Flannigan.....	13 Daniel Street.....	2
The Frank Jones Brewing Company, Limited.....	Islington & Albany Streets.....	8
The Frank Jones Brewing Company, Limited.....	4-5-6 Albany Street.....	3
Daniel A. Leary.....	23 Flint Street.....	2
Oliver E. Locke.....	8 Flint Street.....	2
Thomas Loughlin.....	98 Islington Street.....	2
Thomas Loughlin.....	44 1-2 Islington Street.....	3
Patrick J. Mahon.....	90 1-2 Islington Street.....	2
Michael E. Morrissey.....	32 Penhallow Street.....	3
Michael P. Morrissey.....	6 Vaughan Street.....	2
Raphael Paola.....	90 Market Street.....	2
Patrick O'Leary.....	23 Daniel Street.....	2
Clarence H. Paul.....	11 Ladd Street.....	2
The Christian Shore Bottling Works.....	4 1-2 Albany Street.....	3
James J. Ryan.....	18 Penhallow Street.....	2
Richard Seeley.....	38 Deer Street.....	2
Cornelius Leary, Jr.....	122 Market Street.....	2
Ernest Robinson.....	4 Vaughan Street.....	2
Charles W. Ham.....	6 High Street.....	2
Benjamin Atwell.....	28 Market Street.....	2
*Bertram M. Tilton.....	5 1-2 Ladd Street.....	2
Hussey & Wallace.....	26 Penhallow Street.....	2
Charles F. Wells.....	56 Market Street.....	2
Joseph Sacco.....	110 1-2 Market Street.....	3
Henry P. Payne.....	58 State Street.....	3
Joseph Sacco.....	110 Market Street.....	2
Percy Rowe.....	8 Vaughan Street.....	2
George Q. Pattee.....	The Rockingham Hotel.....	1

ROCKINGHAM COUNTY.—*Concluded.*

Name of Licensee.	Street and Number.	Class.
PORTSMOUTH.— <i>Concluded.</i>		
Portsmouth Brewing Company.....	64 Bow Street.....	8
William D. Grace.....	14 Market Square.....	5
Ralph B. Flynn.....	14 Penhallow Street.....	2
James H. Dixon.....	13 Water Street.....	2
William H. Dunn.....	15 Water Street.....	2
Leslie W. Thompson.....	54 Market Street.....	2
Thomas A. Brownrig.....	35 Hill Street.....	3
Sherman T. Newton.....	Kearsarge House.....	1
John H. Galloway.....	6 McDonough Street.....	2
Dennis J. Carroll.....	34 Penhallow Street.....	2
Rowe & Voudy.....	Langdon Hotel.....	1
Alexander Frazier.....	51 Deer Street.....	2
Charles W. Ham.....	6 1-2 High Street.....	3
Oliver W. Priest.....	5 Ladd Street.....	2
G. W. Armstrong Co.....	B. & M. Station.....	6
Clifford W. Bass.....	19 Congress Street.....	5
Portsmouth Wine Company.....	53 Market Street.....	3
William McGinnis.....	26 Bow Street.....	3
Joseph Hett.....	33-35 Penhallow Street.....	3
Portsmouth Distributing Company.....	34-36 Bow Street.....	3
Newick Brothers.....	1 Cate Street.....	3
Samuel T. Young.....	6 Ceres Street.....	2
Bertram D. Trafton.....	12 1-2 Bow Street.....	2
Allen W. Baker.....	1 Water Street.....	2
*Harry N. Buillard.....	4 Water Street.....	2
*Salvatore Corea.....	77-79 Market Street.....	3
Raphael Paola.....	84 Market Street.....	3
Quinn & Ruxton.....	Hotel DeWitt.....	1
RAYMOND.		
Carl J. Whiting.....	1 Main Street.....	5
RYE.		
William E. Carter.....	Farragut House, Rye Beach.....	1
Gilman M. Lougee.....	Sea View House, Rye Beach.....	1
Charles E. Sleeper & Co.....	Oceanic Hotel, Star Island.....	1

## LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## STRAFFORD COUNTY.

Name of Licensee.	Street and Number.	Class.
DOVER.		
Rochester Bottling Co.....	40 Third Street.....	2
Rochester Bottling Co.....	40 Third Street.....	3
Benjamin F. Kennard.....	503 Central Avenue.....	5
Patrick J. McManus.....	341 Central Avenue.....	2
Patrick J. McManus.....	341 Central Avenue.....	3
Charles McGowan.....	9 Third Street.....	2
Harry G. Davis.....	505 Central Avenue.....	5
Thomas E. Varney.....	434 Central Avenue.....	5
Arthur G. Tufts.....	85 Washington Street.....	5
George E. Varney.....	89 Washington Street.....	5
Turn Exchange Co.....	460 Central Avenue.....	3
Turn Exchange Co.....	460 Central Avenue.....	2
Herbert C. Woodman.....	466 Central Avenue.....	5
John E. Kennedy.....	509 Central Avenue.....	2
Thomas Lamb.....	85-87 Main Street.....	3
Thomas Lamb.....	85-87 Main Street.....	2
Mallen & Loughlin.....	50 Third Street.....	2
Mallen & Loughlin.....	50 Third Street.....	3
Samuel Cassells.....	280 Central Avenue.....	3
James Cauley.....	22 Third Street.....	2
McKernan & O'Neil.....	479 Central Avenue.....	2
Patrick Cragin.....	315 Central Avenue.....	2
Frank Cunningham & Co.....	44 Third Street.....	3
Patrick Devlin.....	561 1-2 Central Avenue.....	2
Thomas Brennan.....	3 Payne Street.....	2
Edward Durnin.....	31 Main Street.....	2
Patrick Cassily.....	11 Payne Street.....	2
A. T. Pierce & Co.....	481 Central Avenue.....	1
Daniel F. Bradley.....	15 St. John Street.....	1
John H. Kelleher.....	Lenox Hotel.....	1
John E. Libbey.....	325 Central Avenue.....	2
Charles O'Fee.....	463 Central Avenue.....	2
Robinson Bros.....	73 Main Street.....	2
Robinson Bros.....	73 Main Street.....	3
Patrick Dillon.....	314 Central Avenue.....	2
David Cassell.....	46 Third Street.....	2
William Vickery & Son.....	362 Central Avenue.....	5
Ben A. Hurd.....	6 Orchard Street.....	2
Simeon Carver.....	206 Central Avenue.....	2
Patrick J. McCarthy.....	79 Main Street.....	2
Harry Dore.....	48 Third Street.....	1
Albert Marcotte.....	77 Main Street.....	2
Patrick Harraty.....	329 Central Avenue.....	2
Patrick Harraty.....	329 Central Avenue.....	3
†Peter Loughlin.....	Dover Point House.....	1
Albert Marcotte.....	473 Central Avenue.....	2
Edward Sheehy.....	307 Central Avenue.....	2
†Peter Loughlin.....	3 Waldron Street.....	2
Chas. T. Newman.....	1 Silver Street.....	5
Thomas McDonald.....	295 Central Avenue.....	2

STRAFFORD COUNTY.—*Continued.*

Name of Licensee.	Street and Number.	Class.
DOVER.— <i>Concluded.</i>		
Walter R. Cox & Co.	Park Tavern	1
Thos. H. McGrail	346 Central Avenue	5
John Dennis	45 Locust Street	2
Patrick J. Durkin & Co.	57 Main Street	2
Patrick J. Durkin & Co.	57 Main Street	3
Samuel Cassells	280 Central Avenue	2
George J. Friel	United States Hotel	1
John J. Sweeney	3 Waldron Street	2
Bridget Loughlin	Dover Point Hotel	1
FARMINGTON.		
Everett S. Gray	24 Central Street	1
†George F. Babb	Roosevelt House	1
MILTON.		
Fred Rowe	Central House	1
Eugene W. Emerson	44 Main Street	5
James Herbert Willey	Main & Silver Streets	5
John F. Quinlan	The Sampson	1
ROCHESTER.		
Joseph Francis Cassidy	42 South Main Street	5
George E. Hayes	Hotel Hayes	1
The Rochester Hotel Company	66 Hanson Street	1
*Mather & Leader	51 South Main Street	1
Henry T. Hayes	6 Main Street	5
ROLLINSFORD.		
Charles E. Lord	Dore & Washington Streets, Salmon Falls	2
Fred Carron	Washington & Franklin Streets, Salmon Falls	3
Fred Caron	Washington & Franklin Streets, Salmon Falls	2
John Hogan	1 Franklin Street, Salmon Falls	2
George W. Nutter	12 Front Street, Salmon Falls	5
George W. Nutter	86 High Street, Salmon Falls	5
Joseph E. Soucey Co.	Washington Street, Salmon Falls	2
Joseph E. Soucey Co.	Washington Street, Salmon Falls	3
Pascal Caron	4 Washington Street, Salmon Falls	2
Pascal Caron	5 Washington Street, Salmon Falls	3
Almon E. Joy	Dover Street, Salmon Falls	1
SOMERSWORTH.		
John C. Hurd	26 Market Street	5
Peter L. Moran	49 Green Street	2
Peter L. Moran	117 Green Street	2
Michael J. Leary	49 Elm Street	2
Napoleon H. Gilbert	23 Myrtle Street	3
Napoleon H. Gilbert	261 Main Street	2
Charles M. Farley	10 Spring Street	2
John Gosselin	173 Main Street	2
William H. Wiggin	24 Market Street	2
William H. Wiggin	24 Market Street	3
James T. Noonan	39 Main Street	2
Rodolphe Lasonde	11 Fore Street	2
Peter Marquis	39 Washington Street	2
Pierre Morin	60-64 Washington Street	2
Francois Morin	253 Main Street	2
George Routhier	8 Fore Street	2

STRAFFORD COUNTY.—*Concluded.*

Name of Licensee.	Street and Number.	Class.
SOMERSWORTH.— <i>Concluded.</i>		
George S. Elliott.....	17 Elm Street.....	2
W. Ashton Horn.....	3 Horn's Court.....	3
Louis Gagne.....	11 Spring Street.....	2
Theodore Bilodeau.....	9 Shorey's Lane.....	2
Honore Girard.....	19 Washington Street.....	2
James Gillespie.....	229 Main Street.....	2
Edward E. Donohue.....	114 Green Street.....	2
Frank E. Hobbs.....	33 Main Street.....	2
Frank E. Hobbs.....	33 Main Street.....	3
James R. O'Clair.....	10 Depot Street.....	2
Polycarpe Tardif.....	Hotel Somersworth.....	1
Alfred St. Hilaire.....	1 Spring Street.....	2
Alfred St. Hilaire.....	1-A Spring Street.....	3
Geo. S. Elliott.....	Great Falls Hotel.....	1

# LICENSES GRANTED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

## SULLIVAN COUNTY.

Name of Licensee.	Street and Number.	Class.
CHARLESTOWN.		
George D. Nourse.....	Main & Summer Streets.....	5
CLAREMONT.		
Edward J. Hendee.....	Hotel Moody.....	1
H. B. Glidden.....	22 Tremont Square.....	5
Frank G. Winn.....	17 Pleasant Street.....	5
Hartley L. Brooks.....	142 Main Street.....	5
Jesse R. Noyes.....	40 Tremont Square.....	5
CROYDON.		
David A. Sargent.....	Croydon House.....	1
NEWPORT.		
Hurd & Bronson.....	Main Street.....	5
Frank W. Nason & Co.....	Newport House.....	1
John R. Kelly.....	62 Main Street.....	5

• License transferred. See list, page 92.

† License revoked. See list, page 93.

‡ License surrendered. See list, page 94.



## LICENSES TRANSFERRED

From May 1, 1910, to August 31, 1910, inclusive.

Showing the present holder and location where exercised,  
and the licensee from whom, or location from which,  
transferred.

Name of Licensee.	Street and Number.	Class.
ENFIELD.		
Harry F. Prescott & Co. ....	Webster House. ....	1
Transferred from Dana L. Young.		
HENNIKER.		
D. L. Young & Co. ....	Hotel Henniker. ....	1
Transferred from Frank A. Hale.		
MANCHESTER.		
Christoph Schrieker. ....	106 McGregor Street. ....	2
Transferred from John T. & Peter Levasseur.		
Noah H. Guay. ....	19 Manchester Street. ....	2
Transferred from 19 to 47 Manchester Street		
Cote & Dallaire. ....	621 Elm Street. ....	2
Transferred from Demas Dwinell.		
Giguere & Ferson. ....	29 South Main Street. ....	2
Transferred from Gleason & Ferson.		
NASHUA.		
Jeremiah D. Hallisey. ....	9 High Street. ....	2
Transferred from 9 to 6 High Street.		
PETERBOROUGH.		
Walter T. Haskins and George Samuel Tucker .	Tucker's Tavern. ....	1
Transferred from Geo. Samuel Tucker.		
PORTSMOUTH.		
Joseph Sacco. ....	110 1-2 Market Street. ....	3
Transferred from 110 1-2 to 108 Market Street.		
Harry N. Bullard. ....	4 Water Street. ....	2
Transferred from 4 to 6 & 8 Water Street.		
Salvatore Corea. ....	96 Market Street. ....	2
Transferred from 96 to 79 Market Street.		
Salvatore Corea. ....	77 & 79 Market Street. ....	3
Transferred from 77 & 79 to 77 Market Street.		
Geo. W. Stillson. ....	5 1-2 Ladd Street. ....	2
Transferred from Bertram M. Tilton.		
ROCHESTER.		
Paul Ladd. ....	New City Hotel. ....	1
Transferred from Mather & Leader.		

LICENSES REVOKED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911.)

Name of Licensee.	Street and Number.	Class.
FARMINGTON.		
George F. Babb.....	Roosevelt House.....	1
NEWMARKET.		
Alexander Roberge.....	The Furber Place.....	2

## LICENSES SURRENDERED

From May 1, 1910, to August 31, 1910, inclusive.

(License year 1910-1911. Licensee deceased.)

Name of Licensee.	Street and Number.	Class.
DOVER.		
Peter Loughlin.....	Dover Point House.....	1
Peter Loughlin.....	3 Waldron Street.....	2



## BELKNAP COUNTY.

## Table

Showing the vote for and against license at the biennial elections of 1908, 1906, 1904, and at the special meeting held May 12, 1903.

(Cities did not vote in 1908 and 1904.)

Cities and Towns.	November 3, 1908.		November 6, 1906.		November 8, 1904.		May 12, 1903.		Population, 1900.
	For license.	Against license.	For license.	Against license.	For license.	Against license.	For license.	Against license.	
Alton.....	141	183	154	105	142	99	142	101	1,500
Barnstead.....	156	150	168	132	108	87	71	96	1,072
Belmont.....	96	164	88	150	97	140	69	147	1,294
Center Harbor.....	17	82	31	73	40	41	33	45	422
Gilford.....	45	83	46	105	14	41	22	69	661
Grimahton.....	109	124	129	102	87	73	47	95	1,100
Laconia.....			724	879			940	423	8,042
Meredith.....	73	363	126	222	172	196	139	214	1,713
New Hampton.....	15	153	26	87	23	70	15	91	852
Sanbornton.....	15	102	116	116	14	79	5	71	944
Tilton.....	116	276	138	230	103	274	177	171	1,926
Total.....	783	1,680	1,645	2,201	800	1,100	1,660	1,523	19,526

# CARROLL COUNTY.

## Table

Showing the vote for and against license at the biennial elections of 1908, 1906, 1904, and at the special meeting held May 12, 1903.

(Cities did not vote in 1908 and 1904.)

Cities and Towns.	November 3, 1908.		November 6, 1906.		November 8, 1904.		May 12, 1903.		Population, 1900.
	For license.	Against license.	For license.	Against license.	For license.	Against license.	For license.	Against license.	
Albany.....	14	9	4	6	3	10	3	30	210
Bartlett.....	53	80	66	91	37	66	38	71	1,013
Brookfield.....	14	46	18	31	13	23	1	13	296
Chadham.....	16	25	8	26	5	28	8	22	269
Conway.....	157	370	157	229	147	261	172	291	3,154
Eaton.....	23	45	8	21	2	14	7	41	365
Effingham.....	29	53	23	49	14	57	9	71	600
Freedom.....	41	77	30	71	9	48	15	53	594
Hart's Location.....		4		4		2			38
Jackson.....	33	70	20	57	28	59	48	57	622
Madison.....	13	64	19	54	6	26	8	70	529
Mauntonborough.....	28	137	45	137	57	89	78	124	901
Osagee.....	97	243	119	167	61	237	47	126	1,479
Saunder.....	26	132	26	118	63	120	54	171	1,077
Tanworth.....	41	63	28	67	10	44	28	116	1,050
Turtonborough.....	46	82	61	71	27	80	12	35	663
Wakefield.....	120	213	160	166	169	193	144	93	1,645
Wolfelborough.....	242	350	319	330	270	256	179	177	2,390
Total.....	993	2,063	1,105	1,695	921	1,613	851	1,561	16,895



## CHESHIRE COUNTY.

## Table

Showing the vote for and against license at the biennial elections of 1908, 1906, 1904, and at the special meeting held May 12, 1903.

(Cities did not vote in 1908 and 1904.)

Cities and Towns.	November 3, 1908.		November 6, 1906.		November 8, 1904.		May 12, 1903.		Population, 1900.
	For license.	Against license.	For license.	Against license.	For license.	Against license.	For license.	Against license.	
Alstead.....	132	40	122	42	137	31	112	48	799
Chesterfield.....	63	77	55	34	86	28	60	22	981
Dublin.....	11	58	11	43	8	25	17	39	620
Fitzwilliam.....	26	109	46	126	49	91	54	127	987
Gilsom.....	42	66	66	52	56	45	52	60	590
Harrisville.....	32	92	41	87	49	86	68	58	791
Hopdale.....	171	306	206	193	210	131	246	142	1,933
Jaffrey.....	103	186	124	153	124	180	151	173	1,891
Keene.....			815	1,167			1,011	931	9,165
Marborough.....	63	151	62	156	82	150	76	147	1,524
Marlow.....	52	58	24	70	59	49	39	45	488
Nelson.....	3	27	4	34	4	21	4	36	285
Richmond.....	25	42	35	45	37	48	40	44	459
Rudge.....	18	78	10	75	20	98	36	126	855
Roxbury.....				7			1	11	100
Stoddard.....	23	5	40	23	43	13	5	32	367
Sullivan.....	2	32	39	39	12	27	5	32	287
Surry.....	14	36	11	37	14	20	8	20	250
Swansey.....	173	217	190	213	123	164	184	163	1,570
Troy.....	69	103	62	117	78	148	92	100	1,527
Walpole.....	244	268	257	174	261	159	210	102	2,693
Westmoreland.....	37	49	31	68	19	47	16	61	875
Winchester.....	194	283	185	203	152	216	251	196	2,274
Total.....	1,497	2,328	2,401	3,167	1,623	1,799	2,738	2,715	31,321

# COOS COUNTY.

## Table

Showing the vote for and against license at the biennial elections of 1908, 1906, 1904, and at the special meeting held May 12, 1903.

(Cities did not vote in 1908 and 1904.)

Cities and Towns.	November 3, 1908.		November 6, 1906.		November 8, 1904.		May 12, 1903.		Population, 1900.
	For license.	Against license.	For license.	Against license.	For license.	Against license.	For license.	Against license.	
Berlin.....				724			566	192	8,886
Carroll.....	30	88	484	62			98	8	710
Clarksville.....	12	54	1	14		74		18	307
Colebrook.....	151	283	109	180		172		234	1,876
Columbia.....	18	59	13	48		21		9	690
Dalton.....	14	74	15	77		37		38	592
Dunbar.....	2	57	13	39		15		13	349
Errol.....	13	28	13	25		16			305
Gorham.....	176	154	162	196		158		41	1,797
Jefferson.....	72	121	58	102		43		14	1,080
Lancaster.....	228	506	301	309		254		215	3,190
Milan.....	61	131	88	77		94		65	1,135
Northumberland.....	149	272	227	81		211		207	1,797
Pittsburg.....	37	59	13	35		10		27	687
Randolph.....	3	14	3	10		11		2	137
Shelburne.....	5	27	4	26		3			283
Stark.....	15	79	28	52		16		26	733
Stewartstown.....	85	56	50	116		111		65	1,150
Stratford.....	35	150	63	131		147		51	908
Wentworth's Location.....	5	13	7	4					58
Whitefield.....	89	286	137	251		189		174	2,157
Total.....	1,200	2,511	1,853	2,559		1,584		1,796	28,887
						1,799		1,403	

## GRAFTON COUNTY.

## Table

Showing the vote for and against license at the biennial elections of 1908, 1906, 1904, and at the special meeting held May 12, 1903.

(Cities did not vote in 1908 and 1904.)

Cities and Towns.	November 3, 1908.		November 6, 1906.		November 8, 1904.		May 12, 1903.		Population, 1900.
	For license.	Against license.	For license.	Against license.	For license.	Against license.	For license.	Against license.	
Alexandria.....	25	77	33	59	3	16	9	55	630
Ashland.....	153	238	165	140	109	161	161	80	1,289
Bath.....	22	194	26	95	29	125	54	105	1,006
Benton.....	7	18	6	13	4	6	6	20	209
Bethlehem.....	56	113	45	82	58	104	55	123	1,261
Bridgewater.....	8	31	7	20	1	24	3	14	244
Bristol.....	115	251	106	226	80	99	79	142	1,600
Campton.....	30	116	41	62	31	79	10	71	999
Canaan.....	175	207	138	121	77	158	99	44	1,444
Dorchester.....	15	17	19	14	6	14	4	20	308
Easton.....	12	17	2	17	4	9	4	30	249
Ellsworth.....	13	6	10	1	1	5	1	4	107
Enfield.....	135	201	151	165	93	150	121	89	1,845
Frankonia.....	19	45	20	55	23	39	5	43	655
Grafton.....	26	128	45	91	52	81	65	66	748
Groton.....	13	16	6	16	6	8	6	17	346
Hanover.....	95	322	44	168	70	281	40	184	1,884
Haverhill.....	296	450	303	428	346	267	263	179	3,414
Hebron.....	25	21	9	17	9	14	4	21	214
Holderness.....	9	137	5	36	11	53	13	49	662

Continued on page 101.

GRAFTON COUNTY.—*Concluded.*

Cities and Towns.	November 3, 1908.		November 6, 1906.		November 8, 1904.		May 12, 1903.		Population, 1900.
	For license.	Against license.	For license.	Against license.	For license.	Against license.	For license.	Against license.	
Landaff.....	21	69	16	32	8	17	14	37	500
Lebanon.....	407	602	372	589	371	599	493	328	4,965
Lincoln.....	9	100	34	62	34	44	24	19	541
Lisbon.....	118	378	99	278	133	213	94	255	2,221
Littleton.....	293	486	267	524	342	431	195	460	4,066
Livermore.....			1	6	1	4			191
Lyman.....	42	34	14	21	24	31	6	31	426
Lynn.....	20	130	14	89	26	77	14	103	1,080
Monroe.....	15	58	14	40	23	48	13	24	545
Orange.....			5	23	3	17	4	5	213
Orford.....	35	73	34	49	28	52	19	54	800
Piermont.....	34	86	16	85	22	82	13	91	637
Plymouth.....	102	406	189	210	121	218	180	87	1,972
Runney.....	24	156	53	110	46	113	58	93	837
Thornton.....	13	89	31	34	12	26	14	46	552
Thurton.....	56	154	105	99	80	137	77	115	799
Warren.....		5		2		1		4	50
Waterville.....	20	141	39	52	16	37	24	56	617
Wentworth.....	28	152	54	99	44	80	59	51	628
Woodstock.....									
Total.....	2,486	5,753	2,538	4,230	2,347	3,927	2,303	3,215	40,844

## HILLSBOROUGH COUNTY.

## Table

Showing the vote for and against license at the biennial elections of 1908, 1906, 1904, and at the special meeting held May 12, 1903.

(Cities did not vote in 1908 and 1904.)

Cities and Towns.	November 3, 1908.		November 6, 1906.		November 8, 1904.		May 12, 1903.		Population, 1900.
	For license.	Against license.	For license.	Against license.	For license.	Against license.	For license.	Against license.	
Anherst.....	53	100	49	103	61	86	56	93	1,231
Antrim.....	48	182	69	150	75	126	85	193	1,366
Bedford.....	19	82	41	99	12	37	7	66	1,148
Bennington.....	93	80	73	69	54	66	46	74	667
Brookline.....	26	68	42	84	56	73	41	56	606
Deering.....	36	27	35	19	29	14	38	23	486
Francestown.....	62	78	64	69	35	88	53	72	693
Goffstown.....	166	255	148	227	166	258	99	169	2,528
Greenfield.....	39	83	44	81	27	79	51	52	605
Greenville.....	141	71	89	113	95	90	95	83	1,008
Hancock.....	62	101	60	85	64	82	51	79	642
Hillsborough.....	242	294	256	248	211	187	231	214	2,254
Holla.....	19	114	18	100	73	100	3	910	1,010
Hudson.....	22	122	28	136	21	88	8	108	1,261
Litchfield.....	3	14	7	19	4	6	9	243	20
Lyndeborough.....	23	69	16	76	15	75	7	65	686
Manchester.....			6,369	1,840			5,861	1,738	56,987
Mason.....	30	35	18	27	4	15	7	30	358
Merrimack.....	102	117	101	114	80	78	131	87	1,234
Milford.....	197	471	242	500	310	453	379	336	3,739

Continued on page 103.

HILLSBOROUGH COUNTY.—*Concluded.*

Cities and Towns.	November 3, 1908.		November 6, 1906.		November 8, 1904.		May 12, 1903.		Population, 1900.
	For license.	Against license.	For license.	Against license.	For license.	Against license.	For license.	Against license.	
Mont Vernon.....	17	49	25	55	25	32	9	39	453
Nashua.....	100	110	2,158	1,303	97	90	2,272	748	23,898
New Boston.....	45	73	105	97	71	54	80	63	1,002
New Ipswich.....	44	90	34	64	38	58	44	58	911
Pelham.....	184	303	36	82	185	212	39	108	875
Peterborough.....	7	2	175	262	18	9	210	263	2,527
Sharon.....	11	52	10	3	25	45	9	9	122
Temple.....	102	176	9	35	111	138	10	32	313
Weare.....	127	210	90	172	137	205	90	100	1,553
Wilton.....	6	6	120	228	1	4	208	117	1,696
Windsor.....				6				5	38
Total.....	2,020	3,434	10,531	6,466	2,039	2,821	10,229	5,200	112,640



## MERRIMACK COUNTY.

## Table

Showing the vote for and against license at the biennial elections of 1908, 1906, 1904, and at the special meeting held May 12, 1903.

(Cities did not vote in 1908 and 1904.)

Cities and Towns.	November 3, 1908.		November 6, 1906.		November 8, 1904.		May 12, 1903.		Population 1900.
	For license.	Against license.	For license.	Against license.	For license.	Against license.	For license.	Against license.	
Allenstown.....	115	60	119	42	113	25	99	25	1,496
Andover.....	163	82	150	100	169	80	146	92	1,179
Boscawen.....	79	184	44	192	99	145	108	141	1,455
Bow.....	9	69	9	91	8	60	4	76	617
Bradford.....	95	133	114	108	116	104	86	106	805
Canterbury.....	40	92	28	65	36	52	.....	36	821
Chichester.....	11	53	30	81	8	46	.....	12	598
Concord.....	.....	.....	2,024	2,271	.....	.....	2,159	1,365	19,632
Danbury.....	14	74	13	75	16	55	29	55	654
Dunbarton.....	16	37	9	48	.....	25	5	39	551
Epsom.....	25	86	18	65	11	61	9	63	771
Franklin.....	.....	.....	602	605	.....	.....	568	476	5,846
Hemiker.....	123	205	137	184	109	118	96	134	1,507
Hill.....	18	78	8	73	9	70	12	78	1,803
Hooksett.....	121	119	153	74	119	32	92	50	1,065
Hopkinton.....	122	261	143	224	109	127	127	164	1,652
Loudon.....	62	118	55	144	70	117	123	133	960
Newbury.....	27	65	30	67	48	56	44	424	424
New London.....	32	97	23	104	31	84	3	97	768
Northfield.....	84	184	50	155	58	202	63	120	1,227
Pembroke.....	293	178	257	150	243	94	211	90	3,183
Pittsfield.....	192	294	160	377	209	298	287	192	2,129
Salisbury.....	47	51	64	64	22	53	31	66	604
Sutton.....	47	93	37	96	31	67	26	93	776
Warner.....	68	214	80	197	76	144	44	113	1,358
Webster.....	36	63	18	71	11	48	12	62	496
Wilnot.....	26	90	26	66	12	47	10	55	653
Total.....	1,859	2,980	4,382	5,789	1,742	2,140	4,423	4,032	52,430

ROCKINGHAM COUNTY.

Table

Showing the vote for and against license at the biennial elections of 1908, 1906, 1904, and at the special meeting held May 12, 1903.

(Cities did not vote in 1908 and 1904.)

Cities and Towns.	November 3, 1908.		November 6, 1906.		November 8, 1904.		May 12, 1903.		Population, 1900.
	For license.	Against license.	For license.	Against license.	For license.	Against license.	For license.	Against license.	
Atkinson.....	11	52	18	38	19	35	9	59	442
Auburn.....	20	54	40	62	64	56	106	65	682
Brentwood.....	22	62	13	58	13	60	8	40	957
Candia.....	70	157	71	107	93	86	47	87	1,057
Chester.....	37	120	33	114	55	139	70	105	861
Danville.....	31	67	34	68	15	44	12	57	615
Deerfield.....	88	155	128	64	53	78	74	54	1,162
Derry.....	554	343	366	415	319	455	365	277	3,583
East Kingston.....	25	44	15	37	17	46	16	36	496
Epping.....	190	107	178	103	187	106	134	102	1,611
Exeter.....	415	456	395	493	407	493	438	486	4,922
Fremont.....	17	67	17	90	25	61	3	88	749
Greenland.....	11	39	28	52	11	16	3	21	607
Hamstead.....	24	90	44	89	30	66	59	91	823
Hampton.....	157	168	169	115	118	154	157	121	1,209
Hampton Falls.....	3	50	1	36	1	49	2	63	560
Kensington.....	31	48	14	39	6	24	9	51	524
Kingston.....	126	115	144	110	108	95	98	50	1,132
Londonderry.....	62	92	46	100	67	122	74	100	1,408
Newcastle.....	24	55	34	50	22	42	12	67	581
Newfields.....	77	60	64	40	76	37	96	33	647

Continued on page 106.

ROCKINGHAM COUNTY.—*Concluded.*

Cities and Towns.	November 3, 1908.		November 6, 1906.		November 8, 1904.		May 12, 1903.		Population, 1900.
	For license.	Against license.	For license.	Against license.	For license.	Against license.	For license.	Against license.	
Newington.....	9	47	5	23	4	41	9	46	390
Newmarket.....	213	143	199	76	303	101	238	79	2,892
Newton.....	71	193	111	82	76	111	81	82	924
North Hampton.....	29	85	33	71	36	48	60	53	812
Northwood.....	88	97	62	90	44	102	19	114	1,304
Nottingham.....	140	43	90	55	102	48	86	40	638
Plastow.....	27	81	43	81	36	70	35	92	1,027
Portsmouth.....			1,340	160			1,797	234	10,637
Raymond.....	80	202	172	137	116	149	109	111	1,100
Rye.....	18	68	27	108	24	78	22	95	1,142
Salem.....	115	262	172	162	36	127	54	171	2,041
Sandown.....	18	60	49	56	53	39	47	31	400
Seabrook.....	94	207	71	204	53	282	102	213	1,497
South Hampton.....	15	13	4	16	5	12	8	36	297
Stratham.....	83	83	27	84	31	46	11	67	718
Windham.....	48	49	26	59	25	54	28	50	641
Total.....	3,009	4,034	4,283	3,744	2,655	3,572	4,498	3,567	51,088

STRAFFORD COUNTY.

Table

Showing the vote for and against license at the biennial elections of 1908, 1906, 1904, and at the special meeting held May 12, 1903.

(Cities did not vote in 1908 and 1904.)

Cities and Towns.	November 3, 1908.		November 6, 1906.		November 8, 1904.		May 12, 1903.		Population, 1900.
	For license.	Against license.	For license.	Against license.	For license.	Against license.	For license.	Against license.	
Barrington.....	43	177	54	213	41	168	107	132	1,208
Dover.....			1,500	765			1,783	748	13,207
Durham.....	28	76	34	78	11	73	17	67	996
Farmington.....	257	474	303	273	253	220	228	193	2,265
Lee.....	22	46	15	65	15	35	3	46	545
Madbury.....	15	38	5	41	4	21	3	43	336
Middleton.....	25	41	15	43	24	43	8	17	300
Milton.....	209	177	172	176	174	98	99	127	1,625
New Durham.....	19	112	39	47	22	32	24	27	625
Rochester.....			747	910			891	530	8,466
Rollinsford.....	163	64	169	55	178	69	130	72	1,701
Somersworth.....			737	175			797	162	7,023
Strafford.....	66	124	61	96	46	81	36	77	1,040
Total.....	847	1,329	3,851	2,937	768	840	4,126	2,241	39,337

## SULLIVAN COUNTY.

## Table

Showing the vote for and against license at the biennial elections of 1908, 1906, 1904, and at the special meeting held May 12, 1903.

(Cities did not vote in 1908 and 1904.)

Cities and Towns.	November 3, 1908.		November 6, 1906.		November 8, 1904.		May 12, 1903.		Population, 1900.
	For license.	Against license.	For license.	Against license.	For license.	Against license.	For license.	Against license.	
Acworth.....	16	54	19	67	15	61	3	40	594
Charlestown.....	123	184	147	131	156	109	155	87	1,473
Claremont.....	492	804	579	556	524	729	771	351	6,498
Cornish.....	107	108	110	89	121	93	98	75	962
Croydon.....	56	43	31	32	48	30	30	21	372
Goshen.....	22	43	25	46	15	59	32	53	345
Grantham.....	16	37	10	38	8	21	15	31	374
Langdon.....	30	31	20	17	24	23	12	33	339
Lempster.....	35	46	25	42	17	39	6	28	391
Newport.....	244	457	291	345	200	431	369	185	3,126
Plainfield.....	43	96	28	80	37	97	40	48	1,114
Springfield.....	31	48	21	58	16	20	14	32	439
Sunapee.....	116	131	95	184	68	156	120	112	946
Unity.....	17	64	34	45	23	65	17	40	572
Washington.....	30	47	29	48	26	33	24	37	464
Total.....	1,378	2,182	1,464	1,778	1,298	1,966	1,706	1,173	18,009

RECAPITULATION.

Counties.	November 3, 1908.		November 6, 1906.		November 8, 1904.		May 12, 1903.		Population, 1900.
	For license.	Against license.	For license.	Against license.	For license.	Against license.	For license.	Against license.	
Belknap.....	783	1,680	1,645	2,201	800	1,100	1,060	1,523	19,526
Carroll.....	993	2,063	1,105	1,695	921	1,613	851	1,561	16,895
Cheshire.....	1,497	2,328	2,401	3,167	1,623	1,799	2,738	2,715	31,321
Coos.....	1,200	2,511	1,853	2,559	1,584	1,799	1,796	1,403	28,887
Grafton.....	2,486	5,753	2,538	4,230	2,347	3,927	2,303	3,215	40,844
Hillsborough.....	2,020	3,434	10,531	6,466	2,039	2,821	10,229	5,200	112,640
Merrimack.....	1,859	2,980	4,382	5,789	1,742	2,140	4,423	4,032	52,430
Rockingham.....	3,009	4,034	4,283	3,744	2,655	3,572	4,498	3,507	51,088
Strafford.....	847	1,329	3,851	2,937	768	840	4,126	2,241	39,337
Sullivan.....	1,378	2,182	1,464	1,778	1,298	1,966	1,706	1,173	18,009
Total.....	16,072	28,294	34,053	34,566	15,777	21,577	34,330	26,630	410,977
Aggregate vote of cities.....			17,500	10,799			18,645	7,547	171,789
Aggregate vote of towns.....	16,072	28,294	16,553	23,767	15,777	21,577	15,685	19,083	239,188
Total.....	16,072	28,294	34,053	34,566	15,777	21,577	34,330	26,630	410,977



# LICENSE CITIES AND TOWNS, AND FEES FOR SECOND, THIRD AND FOURTH CLASS LICENSES.

License Cities and Towns (Biennial election, 1908).	Fees in force August 31, 1909.		
	Class		
	2	3	4
Albany . . . . .	*\$1,200	\$100	\$150
Allenstown . . . . .	250	100	150
Alstead . . . . .	*1,200	*800	*600
Andover . . . . .	*1,200	100	150
Barnstead . . . . .	250	100	150
Bennington . . . . .	*600	*800	*600
Croydon . . . . .	250	*800	150
Deering . . . . .	250	100	150
Derry . . . . .	300	150	200
†Dover . . . . .	600	300	400
Ellsworth . . . . .	250	100	150
Epping . . . . .	*1,200	*800	*600
Gorham . . . . .	*1,200	*800	*600
Greenville . . . . .	*1,200	*800	*600
Hebron . . . . .	*1,200	*800	*600
Hooksett . . . . .	250	100	150
Kingston . . . . .	250	100	150
Lyman . . . . .	250	100	150
†Manchester . . . . .	1,200	800	600
Milton . . . . .	*1,200	*800	*600
†Nashua . . . . .	800	600	500
Newfields . . . . .	250	100	150
Newmarket . . . . .	300	150	200
Nottingham . . . . .	250	100	150

LICENSE CITIES AND TOWNS.—*Concluded.*

License Cities and Towns (Biennial election 1908).	Fees in force August 31, 1909.		
	Class.		
	2	3	4
Pembroke. . . . .	\$300	\$150	\$200
†Portsmouth . . . . .	600	300	400
Rollinsford . . . . .	*500	100	150
Sharon . . . . .	250	100	150
†Somersworth . . . . .	400	200	250
South Hampton . . . . .	*1,200	*800	*600
Stewartstown . . . . .	*1,200	100	150

\* Fee raised under the provision of section 32, chapter 95, Session Laws 1903, and amendments thereto.

† Cities did not vote in 1908.

Respectfully submitted,  
 HENRY W. KEYES,  
*Treasurer.*

CONCORD, September 1, 1910.

CONCORD, N. H., November 17, 1910.

*To His Excellency the Governor and the Honorable Council:*

I have examined each application for license granted, the original record of each license transferred, and the letter of the attorney-general transmitting forfeitures, for the license year May 1, 1909, to May 1, 1910, and find that the total amount of money received by the treasurer of the License Commission for that period to be \$267,649.88.

I have examined the voucher for each item of disbursement for the same period and find the expenditures balance the receipts. See Table 1 in the foregoing report.

The amount of interest received from deposits was verified from the bank statements.

A similar examination of receipts and expenditures for the period May 1, 1910, to July 15, 1910, and the period July 15, 1910, to August 31, 1910, establishes the correctness of Table 2, viz.: receipts \$260,367.00, expenditures \$234,390.33, reserved for expenses \$25,976.67; also the correctness of Table 3, viz.: total receipts, including the amount reserved, \$28,391.58, expenditures \$6,786.27, cash balance, in approved banks, \$21,605.31.

A proper division of the fees between the counties and towns has been made.

Respectfully submitted,

W. B. FELLOWS,  
*State Auditor.*

# LICENSE FEES.

Prescribed by section 7, chapter 95, Session Laws 1903,  
and amendments thereto.

First Class . . . . . \$25 to \$1,000  
(in the discretion of the State Board of License Commis-  
sioners)

## Second Class:

In cities of over 40,000 population . . . .	\$1,200
In cities of from 18,000 to 40,000 population	800
In cities of from 10,000 to 18,000 population	600
In cities of under 10,000 population . . . .	400
In towns whose population exceeds 2,500. .	300
In all other towns . . . . .	250

## Third Class:

In cities of over 40,000 population . . . .	\$800
In cities of from 18,000 to 40,000 population	600
In cities of from 10,000 to 18,000 population	300
In cities of under 10,000 population . . . .	200
In towns whose population exceeds 2,500. .	150
In all other towns . . . . .	100

## Fourth Class:

In cities of over 40,000 population . . . .	\$600
In cities of from 18,000 to 40,000 population	500
In cities of from 10,000 to 18,000 population	400
In cities of under 10,000 population . . . .	250
In towns whose population exceeds 2,500. .	200
In all other towns . . . . .	150

## Fifth Class:

Druggists and apothecaries—When liquor is  
sold only upon a physician's prescription . . . \$10  
When sold otherwise as provided by law \$50 to \$500

(in the discretion of the State Board of License Commis-  
sioners)

Dealers in hardware, paints, and decorating  
materials . . . . . \$10

Sixth Class . . . . .	\$50 to \$200
(in the discretion of the State Board of License Commissioners)	
Seventh Class . . . . .	\$100 to \$300
(in the discretion of the State Board of License Commissioners)	
Eighth Class . . . . .	\$300 to \$2,000
(in the discretion of the State Board of License Commissioners)	
Ninth Class . . . . .	\$300 to \$1,200
(in the discretion of the State Board of License Commissioners)	

# CLASSIFICATION OF CITIES AND TOWNS.

According to fees prescribed for second, third and fourth class licenses, based upon population.

## *Cities over 40,000 population.*

Second Class, \$1,200. Third Class, \$800. Fourth Class, \$600.

Manchester.

## *Cities 18,000 to 40,000 population.*

Second Class, \$800. Third Class, \$600. Fourth Class, \$500.

Concord.

Nashua.

## *Cities 10,000 to 18,000 population.*

Second Class, \$600. Third Class, \$300. Fourth Class, \$400.

Dover.

Portsmouth.

## *Cities under 10,000 population.*

Second Class, \$400. Third Class, \$200. Fourth Class, \$250.

Berlin.

Laconia.

Franklin.

Rochester.

Keene.

Somersworth.

## *Towns over 2,500 population.*

Second Class, \$300. Third Class, \$150. Fourth Class, \$200.

Claremont.

Lebanon.

Conway.

Littleton.

Derry.

Milford.

Exeter.

Newmarket.

Goffstown.

Newport.

Haverhill.

Pembroke.

Lancaster.

Peterborough.

Walpole.

## *All other towns.*

Second Class, \$250. Third Class, \$100. Fourth Class, \$150.





## APPENDIX.



# LAWS OF 1903.

## CHAPTER 95.

### AN ACT TO REGULATE THE TRAFFIC IN INTOXICATING LIQUOR.

#### SECTION

1. Meaning of words "liquor" and "person."
2. Board of license commissioners created; tenure of office; compensation; to give bonds; records and report.
3. Board to have offices in Concord.
4. Board may employ necessary clerks.
5. Special agents; appointment and duties.
6. Classes of licenses; serving liquor at tables; sale of cider; expiration of licenses.
7. Fees for licenses of various classes.
8. Certain persons not to receive licenses; fee to be deposited and bond filed.
9. Building within two hundred feet of church or schoolhouse not to be licensed.
10. Bond of clerk and treasurer of board; disposition of fees collected; records to be open to inspection of certain officers; audit of accounts.
11. Transfer of licenses to other premises.
12. Transfer of licenses to other persons.
13. Surrender of license by administrator, etc.; rebate.
14. Revocation of licenses.
15. Sales of liquor to certain persons prohibited.
16. Hours and days of sale regulated.
17. Sale of adulterated liquor prohibited; liquor not to be served by female or person convicted of felony; doors to be closed at times when sale forbidden; use of screens, etc., prohibited; view of room to be unobstructed.

#### SECTION

18. No recovery for liquor sold to be drunk on the premises; penalty for taking security for debt.
19. Town and city officers may order licensees not to sell, when; penalty for violation.
20. Certain licenses not to be exercised in dwelling house.
21. Certain persons may enter upon premises to inspect; samples of liquor may be taken; penalty for adulteration.
22. Sales by druggists regulated.
23. Druggists to keep record of sales; form of record and certificate.
24. Books, certificates, etc., open to inspection.
25. Fraudulent certificate or prescription; penalty.
26. Fraudulent druggist's license; penalty for sale under.
27. Notice not to sell to habitual drunkard; civil liability for sale after notice.
28. Regulations under first-class licenses to be prescribed by board; penalty for violation.
29. What deemed *prima facie* evidence of sale.
30. False statements in application for license.
31. Acceptance of license provisions by popular vote; sense of voters to be taken, when and how; result to be certified to board.
32. Increase of license fee by town or city.
33. Violations in license town; penalty.
34. Clerk of board to furnish to cities and towns lists of licenses therein.

*Be it enacted by the Senate and House of Representatives in  
General Court convened:*

Meaning of  
words "liquor"  
and "person."

SECTION 1. The term "liquor" as used in this act includes and means all distilled and rectified spirits, wines, fermented and malt liquors; and the word "person" shall include firms, associations, co-partnerships, and corporations.

License com-  
missioners; ten-  
ure of office;  
compensation;  
bonds of; rec-  
ords and report.

SECT. 2. Within ten days from the passage of this act, the governor, with the advice and consent of the council, shall appoint a state board of license commissioners consisting of three members, not more than two of whom shall belong to the same political party, who shall hold office for the term of two, four and six years, respectively, the length of the term of each to be fixed in his commission, and each shall continue in office until his successor has been appointed and qualified. Thereafter, beginning in the year 1905, one member of said board shall be appointed in the month of May of each alternate year for a term of six years from the first Monday in June next ensuing. If a vacancy shall occur in said board it shall be filled for the residue of the term. The chairman and clerk and treasurer of the board shall be appointed and commissioned as such; and the annual salary of said chairman and said clerk and treasurer shall be twenty-five hundred dollars each, and that of the other member twenty-four hundred dollars. No member of said board shall be directly or indirectly interested in the liquor business. The members of said board shall each execute and file with the secretary of state a bond to the people of the state in the sum of ten thousand dollars aside from the treasurer who shall furnish a bond for fifty thousand dollars, with sureties approved by the governor and council, conditioned for the faithful performance of duty. Said board shall keep a record of their doings and hearings, and shall make an annual report to the governor and council on or before the second Monday in each calendar year, which shall contain such statements, facts and explanations as will disclose the actual workings of this act and its bearings upon the welfare of the state, including a statement of all receipts collected

under this act and all expenses incurred, and also such suggestions as to the general policy of the state and such amendments of this act as said license commissioners deem appropriate. Said board of license commissioners may be made a party to all acts and proceedings under this act. From all other parties to such actions and proceedings they shall be entitled to due notice of the proceedings therein, and shall be duly served with copies of all papers bearing thereon. Any or all of the members of said board may be removed by the governor and council on good cause shown.

SECT. 3. Said board of license commissioners shall be provided with suitable rooms for offices in the city of Concord. Offices in Concord.

SECT. 4. Such board of license commissioners, with the approval of the governor and council, are hereby authorized and empowered to employ such clerks as are, in their opinion, necessary for the proper transaction of the business of their office and to fix their compensation. To employ necessary clerks.

SECT. 5. Said board of license commissioners with the approval of the governor and council, may appoint one or more special agents, and fix their compensation. It shall be the duty of said special agents, under the direction of the board of license commissioners, to investigate all matters relating to the collection of license fees or penalties under this act, and in relation to compliance with law by persons holding licenses under the terms of this act. Said special agents may be removed by the board of license commissioners. Any commissioner or special agent may enter any place where liquor is sold, at any time, and may examine any license certificate issued or purporting to have been issued under the terms of this act. He may investigate any other matters in connection with the sale of liquor, and shall make complaints for violations of this act. Special agents; appointment and duties.

SECT. 6. Licenses shall be of the following classes :

First class.—To sell liquor of any kind, to be drunk on the premises, to be issued only to innholders. Classes of licenses. First.

Second class.—To sell liquor of any kind in quantities less than five gallons to one person at one time. Second.



- Third. Third class.—To sell liquor of any kind not to be drunk on the premises.
- Fourth. Fourth class.—To sell malt liquors, cider or light wines, containing not more than fifteen per cent. of alcohol, to be drunk on the premises.
- Fifth. Fifth class.—For retail druggists and apothecaries to sell liquor of any kind for medicinal, mechanical, chemical and sacramental purposes only, and for dealer in hardware, paints and decorating materials to sell alcohol for mechanical and chemical uses only, the same to be sold in accordance with the provisions of this act.
- Sixth. Sixth class.—To sell malt liquor, cider or light wines to be drunk on the premises, to be issued only to keepers of railroad restaurants.
- Seventh. Seventh class.—To sell liquor of any kind to be drunk on the premises, to be issued only to associations, as provided in sub-division 7 of section 8, in the discretion of the board of license commissioners.
- Eighth. Eighth class.—To distillers, brewers and bottlers to sell their product in packages for shipment or distribution to the trade.
- Serving liquor at tables. No licensee of the first, second or fourth class shall serve any liquor at a table or tables in any room where the exclusive or principal business carried on is the sale of liquor. Each license of the first four classes shall specify the room or rooms in which liquor shall be kept or sold, and no liquor shall be kept or sold in any room or part of a building not so specified.
- Sale of cider. No license shall be required for the sale of cider in greater quantities than ten gallons, or by the manufacturer at the press or in an unfermented state.
- Expiration of licenses. All licenses granted prior to May 1, 1904, shall expire on that date, all licenses after May 1, 1904, shall expire May 1 of the following year, and all licensees shall pay for the time from date of issue to the first day of the May following.
- License fees. SECT. 7. Fees for licenses shall be as follows:
- First class, \$25 to \$1,000. First class.—Not more than \$1,000 nor less than \$25 per year, and the state board of license commissioners are hereby

authorized and empowered to fix the fee and restrict, define and limit each license of the first class in their discretion, *provided, however*, no licensee of the first class, in a no-license city or town shall sell or serve liquor except to *bona fide* registered guests who have resorted to his hotel for food or lodging. Such licensee shall not sell liquor to any resident of the city or town in which his hotel is situated, neither shall he maintain or keep a bar room or bar at which liquor is sold.

Hotel regulations in no-license towns.

Second class.—In cities having a population of forty thousand or over, twelve hundred dollars.

Second class, \$250 to \$1,200.

In cities having a population of from eighteen thousand to forty thousand, eight hundred dollars.

In cities having a population of from ten thousand to eighteen thousand, six hundred dollars.

In cities having a population of under ten thousand, four hundred dollars.

In towns whose population exceeds twenty-five hundred, three hundred dollars.

In all other towns, two hundred and fifty dollars.

Third class.—In cities of over forty thousand people, eight hundred dollars.

Third class, \$100 to \$800.

In cities having between eighteen thousand and forty thousand people, six hundred dollars.

In cities having between ten and eighteen thousand people, three hundred dollars.

In cities having a population of less than ten thousand, two hundred dollars.

In towns whose population exceeds twenty-five hundred, one hundred and fifty dollars.

In all other towns, one hundred dollars.

Fourth class.—In cities of over forty thousand people, six hundred dollars.

Fourth class, \$150 to \$600.

In cities of from eighteen thousand to forty thousand, five hundred dollars.

In cities of from ten thousand to eighteen thousand people, four hundred dollars.

In cities having less than ten thousand people, two hundred and fifty dollars.

In towns whose population exceeds twenty-five hundred, two hundred dollars.

In all other towns, one hundred and fifty dollars.

Fifth class, \$10  
per year.  
Sixth class,  
\$50 to \$200.

Fifth class.—Ten dollars per year.

Sixth class.—Not more than two hundred nor less than fifty dollars per year, and the state board of license commissioners are hereby authorized and empowered to fix the fee for each license of the sixth class in their discretion.

Seventh class,  
\$100 to \$300.

Seventh class.—Not more than three hundred dollars nor less than one hundred dollars per year, and the state board of license commissioners are hereby authorized and empowered to fix the fee for each license of the seventh class in their discretion.

Eighth class,  
\$300 to \$2,000.

Eighth class.—Not more than \$2,000 nor less than \$300 per year, and the state board of license commissioners are hereby authorized and empowered to fix the fee for each license of the eighth class, in their discretion, having regard to the quantity of product.

Certain persons not to receive licenses.

SECT. 8. No person shall receive a license under the provisions of this act

1. Who has been or shall be convicted of a felony, or knowingly has in his employ a person who has been so convicted;

2. Who is under the age of twenty-five years;

3. Who is not a citizen of the United States, and a resident of the state of New Hampshire and of the town or city or the adjoining town or city within which he desires to carry on the liquor business, for one year last prior to the filing of his application;

4. Who shall be convicted of a violation of this act, until three years from the date of such conviction;

5. Whose agent or employee shall be twice convicted of a violation of this act, until five years from the date of the second conviction;

6. No co-partnership, unless one or more of the members of such co-partnership, owning at least one-half interest in the business thereof, shall be a resident of this state and a citizen of the United States;

7. No corporation or association hereafter organized under chapter 147, Public Statutes, and the acts amendatory thereof, unless the same shall be equipped to furnish food and lodging to its members;

8. No person who, as owner or agent, shall suffer or permit any gambling to be done in the place designated by the license as that in which the traffic in liquor is to be carried on, or in any other place appertaining thereto or connected therewith, or suffer or permit such premises to become disorderly, or carry on or permit to be carried on, or is interested in any traffic, business or occupation, the carrying on of which is a violation of law.

9. All applicants for a license in classes in which the fee is definite in this act shall deposit with said board the full amount of the license fee with the application and in classes in which said board has a discretion as to the amount of the fee such sum as said board shall direct. In case the license is denied the amount so paid shall be refunded. All applications shall be in form prescribed by said board. No person who shall not, within ten days from the receipt of notice from said board of the granting of his application for a license, file with said board a bond in the sum of double the amount of the license fee paid by him, *provided, however*, no bond shall be accepted for a less amount than five hundred dollars, satisfactory to said board, conditioned upon constant adherence to the terms of said license and the provisions of this act, and recoverable in an action of debt to be brought by county solicitors upon complaint of said board, shall be given such license.

SECT. 9. No license shall be granted for the traffic in liquor in any building which shall be on the same street or avenue within two hundred feet of a building occupied exclusively as a church or a schoolhouse, the measurements to be taken in a straight line from the center of the nearest entrance to the building used for such church or school to the center of the nearest entrance to the place in which the traffic in liquor is desired to be carried on, or in any location where the traffic

Applicant to  
deposit  
amount of fee  
and file bond.

Building  
within 200 feet  
of church or  
schoolhouse  
not to be  
licensed.

shall be deemed by said board of license commissioners detrimental to the public welfare, *provided*, that this restriction shall not apply to hotels or drugstores used as such on the first day of January, 1903.

Bond of clerk and treasurer of board; disposition of fees; records open for inspection; audit of accounts.

SECT. 10. The clerk of the state board of license commissioners shall be also the treasurer of the board, and as such treasurer he shall file with the secretary of state a bond of an indemnity company licensed to do business in this state in the sum of fifty thousand dollars, the cost of which shall be chargeable to the expense of maintaining the office of the board, and conditioned for the faithful accounting of fees collected and forfeitures incurred under the provisions of this act. All such fees and forfeitures shall be paid to the treasurer of said board, who shall, annually, in the month of July, pay one half of the sum so received to the treasurer of the said city or town where the license was granted, and one half to the treasurer of the county in which said city or town is located, first, however, deducting the entire cost of maintaining the office of said board, including all salaries and all expenses attaching to the performance of their duties; also the sum of one thousand dollars, or as much thereof as may be needed to pay the necessary expenses of the state laboratory of hygiene incurred under the provisions of this act, and all expenditures shall be audited by the governor and council. All moneys derived from fees and forfeitures in places where no town organization exists shall be paid to the treasurer of the county in which such place is located. The annual report of said board shall contain a statement by the treasurer of the board of the source from which all moneys received by him were derived, the names of licensees and the classes of licenses, and the street and number in each city or town, when possible, where the licenses are exercised. The records of the state board of license commissioners and all applications for licenses shall be open at all times to the inspection of selectmen, mayors, police officers, prosecuting officers, sheriffs and overseers of the poor. The accounts of the treasurer of the board shall be audited at such times and by such persons as the governor and council



may direct, and the expense of such auditing shall be chargeable to the expense of maintaining the office of the license commissioners.

SECT. 11. If any person holding a license shall desire to transfer to and carry on such business for which the license was issued, in other premises than those designated in the original application and in the license, but in the same city or town and in premises where the traffic in liquor is not forbidden by this act, upon the making and filing of a new application and bond in the form and in the manner provided for the original application and bond, said board shall write or stamp, over its signature, across the face of the license, the words, "The traffic in liquor permitted to be carried on under this license is hereby transferred from \_\_\_\_\_ to \_\_\_\_\_."

Transfer of  
licenses to  
other premises.

SECT. 12. The person to whom a license is issued, except a pharmacist, may sell, assign, and transfer such license during the time for which it was granted to any other person not forbidden to traffic in liquor under the terms of this act, who may thereupon carry on the business for which such license was issued, upon the terms prescribed by it, if such traffic is not prohibited by any of the terms of this act, during the balance of the term of such license, with the same liabilities as the original owner thereof, upon the making and filing of a new application and bond by the purchaser, in the form and manner provided for the original application and bond, and the presentation of the license to said board, who shall write or stamp across its face the words, "Consent is hereby given for the transfer of this license to \_\_\_\_\_;" *provided, however,* that no such sale, transfer or assignment shall be made except in accordance with the terms of this act. For each endorsement under the terms of section 11 or this section of this act, the applicant shall pay the sum of ten dollars, which sum shall be accounted for in the same manner as the original license fees.

Transfer of  
licenses to  
other persons.

SECT. 13. If a person holding a license under the provisions of this act shall die his heirs, executors or administrators may surrender said license to said board, *provided* that said

Surrender of  
license by ad-  
ministrators,  
etc.; rebate.



license shall have at least one month to run, computed from the first day of the month following such surrender; and said license commissioners shall thereupon compute the amount of rebate then due upon such surrendered license for the unexpired term thereof, and the treasurer of said board shall immediately pay back said sum to the person authorized to receive it and shall credit himself with the amount so paid back.

Revocation of  
licenses.

SECT. 14. At any time after a license has been issued to any person, the same may be revoked and cancelled by said board, if any material statement in the application of the holder of the same was false, or if any provision of this act is violated at the place designated in the said license by the holder of the same, or by his agents, servants, or any person whomsoever in charge of said premises. But before any license is revoked or cancelled, the holder shall be entitled to a hearing by said board, and to five days' previous notice thereof in writing, except that licenses of the first class may be revoked at any time, by said board, with or without notice, in their discretion.

SECT. 15. No person shall sell, deliver, or give away, or cause or permit or procure to be sold, delivered or given away, any liquor

Sale of liquor  
to certain  
persons pro-  
hibited.

First, to a minor, nor to a minor for any other person;

Second, to an intoxicated person;

Third, to an habitual drunkard;

Fourth, to any person where notice in writing has been given forbidding sale to such person from the parent, guardian, husband, or wife of such person, or by any magistrate or overseer of the poor of a town or city, or by any prosecuting attorney, or by any county commissioner, or by a selectman.

SECT. 16. No licensee except the holder of a license of the first, fifth or seventh class shall sell, furnish or expose for sale, or give away any liquor

Hours and  
days of sale  
regulated.

First, on Sunday;

Second, on any other day except between the hours of six in the morning and ten at night; unless the town or board of mayor and aldermen of the city where such licensee carries on

each endorsement under the terms of section 11 or this section of this act, the applicant shall pay the sum of ten dollars, which sum shall be accounted for in the same manner as the original license fees.

SECT. 2. Amend sub-division 3, section 17, chapter 95, Laws of 1903, by adding to said sub-division the following words: except that keepers of railroad restaurants and common victualers, who have licenses, shall have the privilege of selling and serving food during the hours when the sale of liquor is forbidden, under such regulations and restrictions as may be prescribed by the state board of license commissioners, so that said sub-division, as amended, shall read as follows: 3. To have opened or unlocked any door or entrance from the yard, street, alley, hallway, room, or adjoining premises, where the liquor is sold or kept for sale during the hours when the sale of liquor is forbidden, except for the egress or ingress of the holder of the license, his agents and servants, when necessary, for purposes not forbidden by this act; or to admit to such room or rooms any other persons during the hours when the sale of liquor is forbidden, except that keepers of railroad restaurants and common victualers, who have licenses shall have the privilege of selling and serving food during the hours when the sale of liquor is forbidden, under such regulations and restrictions as may be prescribed by the state board of license commissioners.

Railroad restaurants may serve food during hours when sale of liquor forbidden.

SECT. 3. All acts and parts of acts inconsistent with this act are hereby repealed and this act shall take effect upon its passage.

Repealing clause; act takes effect on passage.

[Approved April 5, 1907.]

## LAWS OF 1909.

## CHAPTER 117.

AN ACT IN AMENDMENT OF CHAPTER 117 OF THE LAWS OF 1905 ENTITLED, "AN ACT, RELATING TO THE ENFORCEMENT OF THE LAWS RELATING TO THE ILLEGAL SALE OF INTOXICATING LIQUORS IN NO-LICENSE TERRITORY."

## SECTION

1. Taking orders for liquor or sending liquor into no-license town, penalties; license commission to enforce.

## SECTION

2. Takes effect on passage; repealing clause.

*Be it enacted by the Senate and House of Representatives in General Court convened:*

Taking orders for liquor in and sending liquor into no-license town, penalties.

SECTION 1. Chapter 117 of the Laws of 1905, is hereby amended by adding the following new sections to said chapter.

SECT. 14. If any person, partnership, or corporation shall seek, solicit, accept or transmit, in any no-license city or town in this state an order for liquor from any person (the word "liquor" being meant to include its meaning as used in chapter 49 of the session Laws of 1905) to be furnished or procured at any other place, to be delivered to any person or at any place in any no-license city or town in this state; or if any licensee shall fill an order for liquor, to be sent to any person, other than a holder of a license of the first, fifth or sixth class, in a no-license city or town in this state, to be delivered to a common carrier, expressman, truckman or other person for transportation to the purchaser, whether such carrier or other person be the agent of the purchaser for receiving delivery or not, such person, partnership, or corporation shall be punished for each offense by a fine of one hundred dollars (\$100), and if it be a person he shall be imprisoned not exceeding ninety days, and if it be a corporation its charter may be revoked

upon petition to the superior court by the attorney-general of the state, or the solicitor of the county in which the offence was committed; and any licensee filling such order shall be deemed guilty of violating the provisions and conditions of his license and shall be so dealt with by the state board of license commissioners; *provided, however*, that nothing herein shall prevent the seeking, soliciting, accepting, or transmitting of orders in the regular course of business from those who are legally authorized to sell liquor in said no-license cities or towns. SECT. 15. It shall be the duty of the state board of license commissioners to enforce, or cause to be enforced, the provisions of section 14 of this act, and it shall be the duty of said board to prosecute, or cause to be prosecuted, violations of the same.

SECT. 2. This act shall take effect upon its passage, and all acts, or parts of acts, inconsistent with this act, are hereby repealed.

[Approved April 6, 1909.]

## LAWS OF 1909.

## CHAPTER 118.

AN ACT IN AMENDMENT OF CHAPTER 95 OF THE LAWS OF 1903, AS AMENDED BY CHAPTER 49 OF THE LAWS OF 1905, RELATING TO THE REGULATION OF THE TRAFFIC IN INTOXICATING LIQUOR.

## SECTION

1. Licensee to reside where licensed ;  
no new license for year after revocation; all partners must be citizens and residents, when; license board may refuse license to person deemed unfit.

## SECTION

2. Second-class licensee not to sell to women on premises.
3. Takes effect April 30, 1909; repealing clause.

*Be it enacted by the Senate and House of Representatives in General Court convened :*

Licensee to reside where licensed; no new license for year after revocation; partners must be citizens and residents, when; board may refuse license to unfit person.

SECTION 1. Section 8 of chapter 95 of the Laws of 1903, entitled "An act to regulate the traffic in intoxicating liquor," as amended by chapter 49 of the Laws of 1905, is amended as follows: Amend sub-division 3 of said section 8 by striking out the words "or the adjoining town or city," in the third line of said sub-division. Amend sub-division 4 of said section 8 by adding the following words "or whose license shall be revoked until one year from the date of such revocation." Amend sub-division 6 of section 8, by striking out the words: "or an adjoining town or city" in the fifth line of said sub-division; further amend said subdivision 6 by adding at the end of said sub-division the following words: except that in the case of co-partnership licensees of the second, third and fourth classes all the partners shall be citizens of the United States, residents of the State of New Hampshire, and shall have been residents of the town or city within which they desire to carry on the liquor business for one year last prior to the filing of their application; amend sub-division 9



of said section 8 by striking out the words: "satisfaction of said board," in the thirteenth line of said sub-division, and by adding after the word "act" in the fifteenth line of said sub-division, the following words: "and amendments thereto to the satisfaction of said board;" further said sub-division is also amended by adding at the end thereof the following words: Said board may at any time refuse to issue a license to any person whom they consider unfit to receive a license. Amend said section 8 further by adding at the end of said section, in a separate paragraph, the following words: Those licensees of the second, third and fourth classes who, on the date of the passage of this act, do not reside in the town or city within which their respective licenses are operative, shall until May 1, 1910, and not after said date, be subject to the provisions of said sub-divisions 3 and 6 as they were when their present licenses were issued; the provisions of sub-division 3 of this section shall not apply to any pharmacist duly registered in this state who has resided for ten years next prior to the filing of his application in a town or city adjoining the town or city within which he applies for a license of the fifth class and within which he then holds a license of the fifth class; so that said section, as amended, shall read as follows: SECT. 8. No person shall receive a license] under the provisions of this act

1. Who has been or shall be convicted of a felony, or knowingly has in his employ a person who has been so convicted;

2. Who is under the age of 25 years, *provided, however,* that any pharmacist, duly registered in this state, who is 21 years of age and otherwise a qualified person under the requirements of this act, may receive a license of the fifth class;

3. Who is not a citizen of the United States, and a resident of the State of New Hampshire and of the town or city within which he desires to carry on the liquor business, for one year last prior to the filing of his application;

4. Who shall be convicted of a violation of this act, until



three years from the date of such convictions; or whose license shall be revoked, until one year from the date of such revocation;

5. Whose agent or employee shall be twice convicted of a violation of this act, until five years from the date of the second conviction;

6. No co-partnership, unless one or more of the members of such co-partnership, owning at least one-half interest in the business thereof, shall be a citizen of the United States and a resident of the State of New Hampshire, and shall have been a resident of the town or city within which he desires to carry on the liquor business, for one year last prior to the filing of his application, except that in the case of co-partnership licenses of the second, third and fourth classes all the partners shall be citizens of the United States and residents of the State of New Hampshire, and shall have been residents of the town or city within which they desire to carry on the liquor business for one year last prior to the filing of their application;

7. No corporation or association hereafter organized under chapter 147, Public Statutes, and the acts amendatory thereof, unless the same shall be equipped to furnish food and lodging to its members;

8. No person who, as owner or agent, shall suffer or permit any gambling to be done in the place designated by the license as that in which the traffic in liquor is to be carried on, or in any other place appertaining thereto or connected therewith, or suffer or permit such premises to become disorderly, or carry on or permit to be carried on, or is interested in any traffic, business or occupation, the carrying on of which is a violation of law;

9. All applicants for a license in classes in which the fee is definite in this act shall deposit with said board the full amount of the license fee with the application, and in classes in which said board has a discretion as to the amount of the fee such sum as said board shall direct. In case the license is denied the amount so paid shall be refunded. All applications shall be in

form prescribed by said board. No person shall be given a license who shall not, within ten days from the receipt of notice from said board of the granting of his application for a license, file with said board a bond in the sum of double the amount of the license fee paid by him, *provided, however*, no bond shall be accepted for a less amount than five hundred dollars, conditioned upon constant adherence to the terms of said license and the provisions of this act and amendments thereto to the satisfaction of said board and recoverable in an action of debt to be brought by the attorney-general upon notice from said board. Said board may at any time refuse to issue a license to any person whom they consider unfit to receive the same.

Those licensees of the second, third and fourth classes who, on the date of the passage of this act, do not reside in the town or city within which their respective licenses are operative, shall until May 1, 1910, and not after said date, be subject to said sub-divisions 3 and 6 as they were when their present licenses were issued. The provisions of sub-division 3 of this section shall not apply to any pharmacist duly registered in this state who has resided for ten years next prior to the filing of his application in a town or city adjoining the town or city within which he applies for a license of the fifth class and within which he then holds a license of the fifth class.

SECT. 2. Amend section 15 of said chapter 95 by adding at the end thereof the following words: No liquor shall be sold, delivered or given away to any girl or woman on premises covered by a license of the second class; so that said section, as amended, shall read as follows: SECT. 15. No person shall sell, deliver, or give away, or cause or permit or procure to be sold, delivered or given away, any liquor

Second class  
licensee not  
to sell to  
woman on  
premises.

First, to a minor, nor to a minor for any other person ;

Second, to an intoxicated person ;

Third, to an habitual drunkard ;

Fourth, to any person where notice in writing has been given, in accordance with the provisions of section 27 of this chapter, forbidding sale or delivery to such person.

No liquor shall be sold, delivered or given away to any girl or woman on premises covered by a license of the second class.

Takes effect  
April 30, 1909;  
repealing  
clause.

SECT. 3. This act shall take effect upon April 30, 1909, and, except as herein otherwise specified, all acts and parts of acts inconsistent with this act are hereby repealed.

[Approved April 6, 1909.]

## LAWS OF 1909.

### CHAPTER 156.

AN ACT IN AMENDMENT OF CHAPTER 95 LAWS 1903 ENTITLED  
 "AN ACT TO REGULATE THE TRAFFIC IN INTOXICATING  
 LIQUOR."

SECTION

1. Transportation of liquor regulated.

SECTION

2. Takes effect April 30, 1909.

*Be it enacted by the Senate and House of Representatives in  
 General Court convened:*

SECTION 1. Chapter 95 of the session Laws of 1903 entitled "An Act to regulate the Traffic in Intoxicating Liquor," as amended by chapter 49 of the session Laws of 1905, is hereby amended by adding thereto the following sections:

Transportation to no-license territory regulated.

SECT. 36. All liquor to be transported for hire or reward from any point in this state, for delivery in any no-license city or town in this state, shall be delivered by the seller or consignor, to a person, partnership or corporation regularly conducting a general transportation or express business, in vessels or packages plainly and legibly marked on the outside with the name and address, by street and number if possible, of the seller or consignor, and with the name and address, by street and number if possible, of the purchaser or consignee, and with the kind and quantity of liquor contained therein. The receipt, transportation or delivery of liquor knowingly, without the same being labeled as herein provided, or the delivery of liquor, or any part thereof, either by a person, partnership or corporation, when transported as herein provided, otherwise than as designated by the marks or directions thereon, or the delivery of the same to a fictitious person or to a person in a fictitious name, shall be punishable for each offense by a fine of not less than one hundred dollars.

Collection of  
purchase  
price by car-  
rier pro-  
hibited.

SECT. 37. No railroad company, express company, or other common carrier, or any other person, in connection with the transportation of liquor of any kind from one point in this state to any point in a no-license city or town in this state, shall collect the purchase price or any part thereof, before, on, or after delivery, from the consignee, or from any other person, or shall in any manner act as the agent of the buyer or seller of any such liquor, for the purpose of buying or selling or completing the sale thereof, saving only in the actual transportation and delivery of the same.

Carriers to  
keep records  
of deliveries.

SECT. 38. Every person, partnership or corporation conducting a transportation or express business, receiving liquor in this state for delivery to any place in any no-license city or town in this state, or actually delivering any liquor to any person in any no-license city or town in this state, shall keep a book, or books, and plainly enter therein the date of the reception by him, them or it of each vessel or package of such liquor so received for transportation and a correct transcript of the marks and directions thereon and the date of its delivery by him, them or it; and the name of the person to whom delivered shall be signed to the same as a receipt; and said books shall at all times be open to the inspection of the attorney-general of the state, the solicitor and sheriff of the county, the chief of police of the city or town, and the selectmen and prosecuting agent of the town in which said liquor is delivered, and the special agents of the state board of license commissioners. No such person, partnership or corporation so conducting a transportation or express business, shall knowingly receive or deliver any such vessel or package containing liquor, which does not contain the labels or marks prescribed in this act, and any person, partnership or corporation receiving liquors as aforesaid and failing to keep the book and records as herein provided, shall be punished for each offense by a fine of not less than one hundred dollars.

Confiscation  
of liquor.

SECT. 39. All liquors transported in violation of the foregoing sections, or liquor transported according to said section but addressed or marked to a fictitious person or fictitious name, or to a person unknown or who cannot be found, or

liquor shipped C. O. D., together with the casks, bottles and vessels containing the same, may be seized wherever found, whether in transit or storage, and disposed of as provided by section 30 of chapter 112 of the Public Statutes, and, if sold, the proceeds thereof, less costs and expenses, shall be paid into the county treasury.

SECT. 40. Any person, partnership or corporation who shall violate any of the provisions of this act shall be punished by a fine of not less than one hundred dollars. It shall be the duty of the state board of license commissioners to enforce the provisions of this act. Penalty.

SECT. 41. Any person, partnership or corporation delivering or offering for delivery to any person, partnership or corporation conducting a transportation business, any liquor for delivery in a no-license city or town, with the vessels or packages containing such liquor not marked in accordance with the provisions of this act, shall be punished by a fine of not less than one hundred dollars. Penalty.

SECT. 2. This act shall take effect April 30, 1909.

Takes effect  
April 30, 1909.

[Approved April 9, 1909.]



## LAWS OF 1909.

## CHAPTER 167.

AN ACT TO DEFINE THE DUTIES OF THE TREASURER OF THE  
STATE BOARD OF LICENSE COMMISSIONERS WITH REFERENCE  
TO PUBLIC FUNDS.

## SECTION

1. Liquor license receipts, how deposited.

## SECTION

2. Takes effect on passage.

*Be it enacted by the Senate and House of Representatives in  
General Court convened:*

Liquor license  
receipts, how  
deposited.

SECTION 1. The treasurer of the State Board of License Commissioners shall deposit any portion of the public funds in his possession in such national banks within this state or such trust companies incorporated under the laws of, or doing business within this state, as shall be approved, at least once in six months, by the governor and council, but the amount deposited in any one bank or trust company shall not at any one time exceed forty per cent. of its paid up capital and surplus. Other things being equal, those banks or trust companies shall receive preference which will allow interest on daily balances.

All interest received on such deposits shall be distributed to such towns and counties in this state proportionally in the same manner as said public funds in his possession are distributed.

Takes effect  
on passage.

SECT. 2. This act shall take effect upon its passage.

[Approved April 9, 1909.]

STATE OF NEW HAMPSHIRE

---

Thirty-fifth Annual Report

OF THE

Commissioners of Pharmacy

For the Year 1910

PENACOOK, N. H.  
W. B. RANNEY, PRINTER  
1911

## Table of Contents

Letter of Transmissal	-	-	-	-	5
Official Board, Names of	-	-	-	-	6
Report of Board	-	-	-	-	7
Examinations	-	-	-	-	8
Registrations	-	-	-	-	8
Reciprocity	-	-	-	-	9
Prosecutions	-	-	-	-	10
Headquarters	-	-	-	-	10
Condition of Pharmacy	-	-	-	-	11
Rulings of Commission	-	-	-	-	13
Alphabetical List of Registered Pharmacists	-	-	-	-	15
Pharmacy Law	-	-	-	-	26



## Letter of Transmissal

DECEMBER 1, 1910

TO HIS EXCELLENCY, HENRY B. QUINBY, GOVERNOR  
OF NEW HAMPSHIRE, AND HONORABLE COUNCIL.

GENTLEMEN:

In compliance with Chapter 135, General Statutes, relating to Pharmacy and the sales of drugs and medicines I have the honor to transmit herewith the report of the Board of Pharmacy for the year 1910.

FRANK H. WINGATE, *Secretary*.



## Board of Commissioners

EDWARD H. CURRIER, M. D.	-	-	<i>President</i>
FRANK H. WINGATE,	-	-	<i>Secretary</i>
ALBERT S. WETHERELL,	-	-	<i>Auditor</i>

# Report of Commissioners of Pharmacy

---

CONCORD, N. H. December 1, 1910.

TO HIS EXCELLENCY, THE GOVERNOR AND

HONORABLE COUNCIL:

Your commissioners have the honor to submit the thirty-fifth annual report of the Commission of Pharmacy and Practical Chemistry of the State of New Hampshire for the year ending Oct. 25th. 1910.

Regular quarterly meetings, of three days each, have been held as required by law, also special meetings as any necessity demanded. We are limited to twenty-five days service each year which we find is hardly sufficient.

At our annual meeting in October 1909, the following officers were elected to serve one year; President, Edward H. Currier of Manchester; Secretary, Frank H. Wingate of Nashua; Auditor, Ben O. Aldrich of Keene.

On February 28th. Ben O. Aldrich, an honored member of this Board for fourteen years resigned his commission.

His associate commissioners desire to express their sincere regret, and to record their estimation of his sterling work, and ability. Mr. Aldrich has served the State with credit to himself and benefit to the cause of Pharmacy.

He has discharged his duty as commissioner with fidelity and honor, and as guardian of our interests in the legislature, has displayed rare judgment and wise discretion.

Albert S. Wetherell was appointed by His Excellency to fill the unexpired term of Mr. Aldrich, March 2nd. June 18th Mr. Wetherell received his appointment as Commissioner for three years.

### EXAMINATIONS.

Thirty-eight applicants have taken the examination for Registered Pharmacists. Six for that of Registered Assistant.

Of these, there were successful, fifteen seniors and five juniors, a larger percentage of successful applicants than usual. To these have been granted certificates of Registration.

The examination, both written and oral, includes the following subjects, viz:

Chemistry, Theoretical and Practical Pharmacy, Botany, Materia Medica and Therapeutics, Toxicology, Examination and Identification of Drugs and Medicines.

Percentage required 75 per cent.

For the accommodation of all concerned, it has been decided that meetings for examinations be held on the fourth Wednesday of every month, except July and August, such regulation to be in force after April 1, 1911. Every person shall file his application with the Secretary at least ten days before each meeting. Blank forms are furnished for that purpose.

### RE-REGISTRATION.

Re-registration is having its first year of trial.

The clerical work incident to the institution of this new and long desired regulation, has been considerable, and some expense has been incurred which has been met by the Commissioners themselves.

New Hampshire is the only state in the Union which requires no fee of its pharmacists for registration, and pays nothing for conducting the same.

A notice was sent to every registered pharmacist whose name appears in our records.

Beginning in January 1910, there has been a prompt compliance on the part of pharmacists generally, with statutory requirements, 375 having been registered as in good standing.

This requirement of registration makes it possible for your commission to endorse and recommend to other state boards, applicants for reciprocity certificates, enabling the applicants to find professional employment in other states.

An alphabetical list of registered pharmacists in New Hampshire is elsewhere a part of this report.

## RECIPROCITY

The additions made to the Pharmacy Law by the Legislature at its session in 1909 have marked a new era in the status of Pharmacy, besides adding much to the duty of your commissioners.

The country seems bent on reciprocity in everything, which if carried too far may endanger the landmarks of state rights..

The establishment of certificates of reciprocity between states, begun with sundry misgivings, has been attended with success and thus far we can see no cause for complaint. Our mutual relations with boards of other states have been harmonious and a spirit of tolerance and equity fostered, which should be productive of better conditions and we could wish that our State might make it possible, by remitting the expense, for its commissioners to attend the annual meetings of the New England Associates, where much is accomplished in the way of interstate progression.

The following table shows the exchange of reciprocity certificates between New Hampshire and other New England States.

From		To
3	Maine	3
9	Vermont	2
17	Massachusetts	9
3	Connecticut	3

## PROSECUTIONS.

The case of State vs William C. Spicer of Penacook unfinished in last report has been concluded.

In the superior court in Merrimack County on April 14th, 1910 a fine of One Hundred (\$100.) Dollars and costs was imposed, as the penalty for illegally conducting a drug store.

This is the thirtieth consecutive case of prosecution which the board has carried to a successful settlement.

Your commissioners have visited the following places in discharge of their duty as declared in Sect. 12, Chap. 135. Concord, Manchester, Nashua, Alton, Rochester, Portsmouth, Center Harbor.

## HEADQUARTERS IN STATE HOUSE.

Notwithstanding our request for proper accommodations in the spacious remodelled State House, was made early to the Chief Executive, we are unable to obtain but one small room wholly inadequate to our needs.

It was hoped by our commissioners that suitable apartments might be provided wherein practical work in our examinations could be exemplified the same being acknowledged to be the great practical test of ability. In this effort we are doomed to disappointment.

The above plan would be more economical for the state in saving the expenses incurred in securing accommodations in different localities for our examination meetings.

Hitherto we have met wherever could be found rooms, in hotel annexes, halls, etc. sometimes with disadvantage.

Oct. 28th. '10 the N. H. Commission of Pharmacy attended

the Annual Meeting of the New England Association Boards of Pharmacy at the State House Boston, Mass. on above date. There were twenty-five members present and the session was a very interesting one, much important business pertinent to the occasion was transacted, and the meeting was productive of a great deal of good.

### CONDITION OF PHARMACY.

Your Commissioners would represent that Pharmacy in our commonwealth has undergone much improvement. The amendments enacted at the last session of the legislature have already demonstrated their practicability, and the endorsement of the same by the fraternity proves the wisdom of the General Court.

We believe the following statement should be included in our report for the consideration of the fraternity and the people.

Criticism may, we think, justly obtain of the conditions existing in many, so called, first class pharmacies in our commonwealth, relative to the too common practice of permitting the junior clerk, or apprentice to alone make whatever galenical preparations are manufactured on the premises.

This particular and exacting work should be done, and it is supposed to be done, only by competent and skilled pharmacists of experience and integrity, rather than by the willing, but too often inexperienced clerk, left to his own resources, with little or no instruction and guidance from the registered pharmacist in charge of the drugstore, be he owner or clerk.

This condition, all too prevalent, is not only hazardous to the proprietor in his business and reputation but is at variance with the true spirit of the law, made for the protection of the people, as a safe-guard against incompetency, error and sophistication.

We note with regret the trend towards increased commercialism on the part of druggists to the detriment of



scientific and professional pharmacy. We deplore the passing of the Apothecary with the painstaking care, the scholarly attainments and professional integrity of the old school.

EDWARD H. CURRIER,  
FRANK H. WINGATE,  
ALBERT S. WETHERELL,  
*Commissioners of Pharmacy.*

## Rulings of the Commission

---

Apothecaries, druggists, and all persons engaged in the manufacture, compounding or selling of drugs, poisons or medicines are required to be extraordinarily skillful, and to use the highest degree of care known to practical men, to prevent injury from the use of such articles and compounds.

The Pharmacy law requires that every drug store in New Hampshire must be under the direct charge of a registered pharmacist of this state, and also requires that every person who sells drugs and medicines, or compounds or dispenses medicines shall be registered.

A registered assistant may sell drugs and medicines at any time under the direct supervision of a registered pharmacist, and he is the only person so privileged. A registered assistant has no right or authority to manage or conduct a pharmacy, either on his own account or for another. He may, however, act as clerk or salesman in a drug store or pharmacy, during the temporary absence of the owner or manager.

The Commission of Pharmacy construes the words "temporary absence" to mean while the registered pharmacist is gone to his meals or any like necessary duty, requiring no more time than is generally so consumed. Prolonged or unnecessary absence is not contemplated.

The registered assistant can not take charge of a store for weeks at a time. It is the evident intention of the Pharmacy law to keep every drug store or pharmacy under the immediate charge or supervision of a registered pharmacist during all the times the drug store or pharmacy is open for business.

Any place where drugs and medicines are sold is a drug store within the law.

A practising physician unregistered can not keep a drug store or sell drugs or medicines which he has not prescribed.

The total average percentage to obtain registration is seventy-five per cent.

Graduates of Schools of Pharmacy will not be registered without examination.

Graduates of Schools of Medicine will not be registered without examination.

The Commissioners have officially sanctioned the sale of the following articles by unregistered persons, believing they are not included in the terms 'drugs and medicines:— Alum, ammonia, baking powder, benzine, borax, brimstone, blue vitriol, camphor, copperas, cream tartar, chloride of lime, flavoring extracts, glycerine, hellebore, insect powder, Iceland moss, Irish moss, indigo; oils—sweet, olive, machine, sperm, linseed, petroleum; potash, resin, saleratus, sal soda: seeds--flax, canary, anise, hemp, millet, coriander: spirits of turpentine, washing compounds.

# Registered Pharmacists of New Hampshire

Name	Residence	Date of Registration	No. of Certif.
Abbott Charles R.	Hanover	1-22-08	800
Abbott Walter H.	Hillsborough	1-25-93	518
Adams Arlan C.	Concord	1-28-91	463
Ahern John H.	Concord	1-26-10	829
Aldrich Ben O.	Keene	1-25-93	517
Aldrich Don H.	Whitefield	10- 9-78	
Allen Edward M.	Canaan	1-27-86	352
Allen Robert E.	Canaan	10-28-03	718
Allen W. A.	Hanover	1- 1-10	Rec.
Amsden George A.	Enfield	1-10-83	292
Anderson Henry W.	Exeter	12-17-86	372
Atwood Elmer E.	Penacook	1-25-99	625
Babson Waldo	Berlin	4-28-07	591
Bacon Charles C.	Greenville	7-25-00	657
Bailey Loren H.	Salem Depot	4-25-06	774
Bangs Fred W.	Lisbon	12-11-94	545
Barbour Fred S.	Charlestown	1875	
Barbour George F.	Concord	7-27-10	837
Barrett Alonzo D.	Gorham	4-26-05	735
Barrett Ensign	Gorham	4-27-08	615
Bartlett Charles	Derry	4-23-90	444
Bartlett Justin F.	Manchester	3-10-00	Rec.
Bass Clifford W.	Portsmouth	1-27-04	719
Bates Chester A.	Jefferson	1-23-01	662
Bean Edwin C.	Belmont	10- 9-83	304

Bean J. Arthur	Concord	7-26-93	526
Beauregard Octave C.	Manchester	4-22-96	568
Bell S. Howard	Derry	4- 2-99	
Belisle Armand F.	Concord	4-21-00	651
Belisle Armand L.	Manchester	10-29-09	823
Benson Harry L.	Derry	1-25-99	629
Berry George A.	Concord	10-26-87	385
Berry John R.	Concord	1-23-95	545
* Blanchard Willis H.	Nashua	11- 2-92	508
Blonquest Charles C.	Manchester	7-25-00	658
Boardman George W.	Portsmouth	1-23-93	547
Boire Paul H.	Manchester	1-30-89	401
Boutillier Medric U.	Nashua	4-18-85	333
Brandes Frederick A.	Concord	4-22-08	805
Brien A. A. E.	Manchester	4- 5-87	376
Briggs George A.	Claremont	2-17-81	256
Brockway Edward A.	Manchester	5-31-81	266
Brooks Hartley L.	Claremont	1875	
Bronson Frank E.	Newport	10-24-00	660
Brown Fred W.	Plymouth	10-28-91	484
Brown William H.	Pittsfield	10-25-99	643
Bryan Fred E.	Lisbon	7-89-09	Rec.
Buck Guy H.	Lebanon	4-24-07	786
Buckley Daniel J.	Dover	4-28-97	599
Burbank James O.	Manchester	1-22-79	
Burbank Walter H.	Manchester	4-25-06	772
Burnham R. DeWitt	Rochester	10- 9 83	303
Burque Arthur O.	Nashua	1-24-06	760
Butler Harry C.	Keene	4-22-96	566
Buxton Harry B.	Winchester	1-25-93	510
Callahan Percy J.	Manchester	1-26-10	828
Campbell Albert E.	Groveton	10-24-96	779
Carpenter Fred D.	Lancaster		750
Carpenter George W.	East Jaffrey	10-27-86	366
Cassidy Joseph F.	Rochester	10-24-06	781

Castor Edgar E.	Manchester	1-27-97	579
Chipman Walter A.	Manchester	1-22-96	564
Clark Arthur E.	Concord	4-24-95	552
Clark Chester H.	Concord	1-27-09	820
Clark George H.	Woodsville	7-27-92	502
Clough Arthur F.	Laconia	1-23-01	667
Clough Burton T.	Tilton	4-27-92	496
Coburn Adrian S.	Exeter	10-27-08	808
Coburn Everett R.	Manchester	7-27-10	835
Coleman Fred B.	Portsmouth	10- 8-75	
Collins Clarence M.	Exeter	4-23-03	710
Collins George A.	Lakeport	4-23-90	441
Cote Louis J.	Berlin	12-16-99	609
Cournoyer J. Arthur	Berlin	10-24-06	718
Cowan Amos J.	Salem Depot	7-28-97	603
Currier Edward H.	Manchester	1875	
Currier George W.	Nashua	1875	
Dam Edward L.	Concord	1-27-92	486
Danforth C. O.	Penacook	1- 1-10	Rec.
Daniels Milton F.	Keene	2- 4-10	831
Davidson Frederick H.	Concord	12- 9-96	
Davis Archie I.	Keene	6-11-01	683
Davis Arthur P.	Walpole	4-24-07	789
Davis Charles F.	Littleton	4-23-90	440
Davis Harry G.	Dover	7-26-93	
Davis Walter R.	Concord	10-25-99	642
Davis Wilbur S.	Sanbornville	10-28-96	572
Dennahan John T.	Concord	10-23-95	561
Denning Charles R.	Concord	1-25-99	627
Denoncour Antonio J.	Greenville	1-27-09	817
Dickey William F.	Antrim	1-26-98	614
*Dignam Joseph F.	Manchester	10- 1-84	
Dolloff Albert	New Hampton	10-17-82	287
Dolloff Clarence W.	Concord	12- 3-79	239
Dow James L.	Lancaster	1-27-86	350
Downing Lucien B.	Hanover	8-23-75	



Driscoll Thomas D.	Portsmouth	1- 1-10	Rec.
Duncan George C.	Jaffrey	7-26-99	637
Dunlap William H.	Concord	1875	Rec.
Dunnington Charles G.	Manchester	1-27-97	582
Dunnington Herbert E.	Manchester	7-23-02	6987
Durgin Will J.	Wilton	12-20-82	291
Dutton Salmon F.	Keene	1-25-03	516
Eaton Harry T.	Claremont	7-23-90	457
Eddy Charles L.	Franklin	1-10-89	405
Emmerson Eugene W.	Farmington	3-17-81	259
Emmerson Wesley O.	Groveton	1-22-08	801
Evans Wilbur J.	Farmington	3-17-81	259
Fall Horace P.	Dover	1-22-90	428
Farwell Harry E.	Concord	4-23-02	697
Field Jesse W.	Hinsdale	7-26-05	746
Fiske Virgil G.	Dover	10-27-09	824
Fitch A. Perley	Concord	8-31-75	
Flint C. G.	Concord	10-26-04	Rec.
Flynn Joseph A.	Concord	10-26-04	730
Forbush George L.	Peterboro	1875	
Forrest Ralph A.	Concord	7-26-65	743
Foster William E.	Laconia	1875	
Foster George A.	Warren	10-28-03	715
Fowler George H.	Bristol	1875	
Fowler Wynne H.	Penacook	4-25-96	770
French Frank R.	Tilton	10-25-05	752
French William F.	Milford	4-24-88	408
Giguere Oscar L.	Manchester	10-22-90	460
Gilbert Frank A.	Concord	1-25-99	632
Gile Alton A.	Keene	4-23-90	431
Gilman Lewis E.	Manchester	4-26-93	521
Gilmore George A.	Epping	4-25-10	650
Gilmore John H.	Concord	1-25-99	631
Glidden Harvey B.	Claremont	4- 5-87	373
Goodwin Henry C.	Somersworth	1875	

Googins George I.	Portsmouth	7-27-04	727
Gonga Fred A.	Concord	10-27-94	542
Gordon George E.	Suncook	9-28-80	
Grace William D.	Portsmouth	7-10-84	345
Grant Victor A.	Concord	5-29-83	299
Graves Delford R.	Newport	10-22-90	459
Graves Harry A.	Manchester	7-28-09	821
Gray Fred H.	Nashua	4-26-93	524
Green Benjamin	Portsmouth	4-28-86	354
Green Frederick E.	Littleton	10-27-97	606
Green Samuel H.	Newmarket	8-31-75	
Greer Ernest E.	Manchester	10-27-97	687
Greer Frank A.	New Boston	6-27-92	497
Gregoire Joseph H.	Concord	4-27-04	723
Gregory Warren E.	Franklin	1-25-99	624
Griffin Rodney A.	Franklin	4-27-92	616
Grimshaw Albert H.	Keene	7-27-04	728
Hagland Ernest E.	Manchester	4-28-09	819
Hall Lewis H.	Milford	4-23-90	
Hancock Elmer W.	Hillsboro	1- 7-02	687
Hanscom Jessie L.	Manchester	4-26-05	741
* Harvey Charles H.	Manchester	10-27-86	371
Hayes Albion E.	Exeter	1-26-98	612
Hatch Elwin E.	Manchester	9- 9-02	701
Hatch Fred B.	Woodsville	3-17-84	313
Hayes Henry T.	Rochester	7-24-95	548
Hayes Warner	Exeter	9-21-05	729
Hayward Edgar C.	Nashua	1-23-97	784
Hawkins Ellsworth W.	Concord	4-24-01	676
Head Natt	Hillsboro	2-27-92	499
Herrick Charles P.	Tilton	1877	353
Higgins George	Nashua	7-22-96	569
Hodgkins Bert N.	Keene	4-23-90	446
Holland John J.	Manchester	4-15-86	
Hopkins Frank C.	Keene	10-23-07	478
Hoyt Alfred S.	Manchester	10- 9-09	700

Hoyt J. Irving	Penacook	9-28-85	
Hurd Carlton	Newport	9- 2-75	
Hurd John C.	Somersworth	1-22-90	427
Hussey Harry L.	Dover	2-27-92	Rec.
Hutchins John C.	No. Strafford	11-28-86	359
Ingalls Frank E.	Manchester	10-26-75	
Johnson Herbert B.	Peterboro	10-27-09	825
Jones Fred H.	Hinsdale	7- 8-85	342
Kelley Frank J.	Concord	10-28-08	811
Kelley John R.	Newport	4-26-05	738
Kelley Park H.	Manchester	1-23-84	
Kemple George R.	Franklin	1-22-90	425
Kennard Benjamin F.	Dover	1-23-84	311
Kerwin James J.	Manchester	1-21-94	533
Kincaid Frank N.	Lisbon	7-28-90	458
Kilton Jay W.	West Lebanon	3-28-06	762
Knight Joseph E.	Exeter	4-23-84	315
Knowlton George H.	Manchester	5-29-83	296
Labombarde Wm. C.	Nashua	4-22-08	804
Lane Edmund M.	Antrim	1-27-09	815
LaRose Louis E.	Nashua	4-28-86	356
Lamprey Prescott C.	Laconia	1875	
Leckie Robert A.	Manchester	10-28-08	813
Leonard Willard C.	Concord	4-25-94	537
Lewis Frank B.	Whitefield	4-25-88	393
Lewis Harry A.	Concord	10-28-08	812
Libby Norman E.	Concord	4-24-07	793
Little William O. B.	Dover	7-26-05	745
Littlefield Chauncy B.	Manchester	6-22-79	262
Lord George W.	Tilton	1- 7-82	275
Lord Lester W.	West Ossipee	1-24-06	785
Lovely Fred S.	Lebanon	10-25-05	757
Low Joseph H.	Derry	4-22-08	803
Lowe Michael J.	Lancaster	7-25-06	775
Lovering Walter A.	Nashua	5-29-83	297
Lussier Victor	Nashua	10- 9-83	305

Lyford Earle H.	Berlin	1-28-03	707
Lynch James E.	Littleton	1-25-05	733
Lynch John P.	Concord	1-26-10	830
Mallard George F.	Laconia	1875	
Mann Ezra B.	Woodsville	1875	
Mann Ira W.	Woodsville	4-22-96	565
Marshall J. Albert	Manchester	1-24-00	647
Marshall John H.	Manchester	1-25-81	252
Marston Harold C.	Lisbon	1-19-82	276
Martel Charles C.	Nashua	4-22-97	593
Mathes John M. Jr.	Bethlehem	4-27-10	833
McCrillis Ernest J.	Franklin	1- 7-02	690
McCrillis William G.	Bristol	3-26-02	691
McDonough Hugh F.	Concord	1-22-08	802
McFadden Harry C.	Wolfeboro	4-26-05	736
McField Edwin S.	Hinsdale	10-22-02	705
McGrail Thomas H.	Dover	4-24-95	
McLaughlin Melvin K.	Manchester	1-22-90	423
McNamara Frank P.	Concord	1-23-07	783
McNeil Charles A.	Lebanon	4-28-97	589
Merrill Lewis P.	Stewartstown	10-25-05	755
Mertsch Otto F.	Warren	10-28-08	809
Mitchell Walter B.	Manchester	10- 1-85	343
Miville Francis G.	Manchester	4-25-76	
Miville Emile D.	Manchester	4-27-10	836
Morin John B.	Somersworth	4-25-05	653
Morrison Charles W.	Meredith	12-10-83	308
Morgner Otto F.	Concord	10-24-06	777
Morse Charles M.	Nashua	1-26-87	375
Moxley Roland R.	Hillsboro	4-25-06	773
Murdoch William	Manchester	4-25-00	655
Murphy Matthew E.	Alstead	4-12-03	712
Murray Nelson H.	Concord	1- 1-10	Rec.
Nelson Edward L.	Franklin	4-28-97	590
Newman Charles T.	Dover	2- 7-77	
Norton William N.	Portsmouth	10-24-91	543

Nourse George D.	Charlestown	7-26-93	634
Noury Sabin	Manchester	6- 4-01	682
Noyes Ernest L.	Concord	4-26-99	633
Noyes Fred W.	Gorham	7-28-86	364
Noyes George D. S.	Pittsfield	10-11-75	
Noyes Jessie R.	Claremont	4-24-07	783
Noyes Parker J.	Lancaster	1875	
Nutter George W.	Salmon Falls	1-27-92	489
O'Connor E. T.	Claremont	10-26-87	387
Orcutt Willard V.	Concord	10-28-08	810
Palmer George S.	Suncook	2- 9-78	
Parent William J.	Suncook	7-26-93	527
Parr Joseph A.	Manchester	4-26-05	742
Parrott Frank A.	Center Harbor	4-24-07	796
Peasley John C.	Plymouth	4-24-01	670
Peavy Aldana	Rochester	3-17-81	258
Pehlman Herman	Manchester	7-25-04	544
Perley Isaac N.	Lebanon	8-23-75	
Petit Alexander A.	New Bedford	4-27-04	724
Perreault Alfred F.	Nashua	7-26-99	635
Perry Charles Sevens	Hillsboro	1-24-94	531
Philbrick Goodwin F.	Portsmouth	1-28-91	472
Pike Charles E.	Concord	7- 6-82	382
Place Alvah H.	Newmarket	4-28-86	360
Plaisted John F.	Concord	7-22-03	714
Plummer Clarence W.	Lakeport	1-25-93	511
Plumer Frank E.	Dover	1-26-98	611
Pope Charles F.	Colebrook	1-27-97	584
Porter Bert P.	Ashland	1-25-97	622
Porter Fred C.	Manchester	1-22-90	424
Potvin Moire	Manchester	1-28-91	461
Precourt Albert J.	Manchester	4-23-90	437
Precourt Archie F.	Manchester	7-24-01	684
Prescott Herbert A.	Franklin		792
Price Samuel J.	Manchester	4-24-95	550
Prince Henry W.	Littleton	10-25-05	753

Proctor Elwin N.	Milford	4-29-89	377
Provencher Zepherin	Manchester	7-17-84	319
Putnam Ernest L.	No. Woodstock	6- 4-01	681
Putnam Robert J.	Hanover	10-27-07	796
Quimby George A.	Laconia	1-23-01	664
Reed Frank H.	Contoocook	4-25-00	732
Rice Herbert E.	Nashua	10-25-93	530
Richardson George H.	Concord	1-28-91	465
Robbins Edmund H.	Manchester	10-24-06	780
Rockwood Paul	Dover	1-25-05	732
Royder Albert C.	Derry	7-26-99	636
Roy Arthur J.	Tilton	10-25-05	752
Russell Frank W.	Plymouth	Oct. 1875	
Rydin Carl E.	Manchester	1-25-93	512
Sanborn Everett P.	Hampton	10-23-06	782
Sanborn Herbert L.	Concord	4-23-90	439
Sanborn Ray W.	Meredith	1-27-09	818
Sanborn William C.	Rochester	10-12-81	273
Sanderson Wm. S. P.	Gilmanston	5-29-83	298
Seannell William P.	Concord	10-25-05	758
Seifert Albert H.	Nashua	4-25-00	654
Seward William H.	Exeter	4-24-95	549
Shaw George W.	Conway	4-27-87	380
Shedd Charles G.	Keene	4-23-84	317
Sherry George H.	Dover	1-28-91	471
Shorey Alton M.	Conway	10-22-02	702
Shurtleff Lyman O.	Whitefield	8- 4-81	270
Silver Charles E. Jr.	Concord	1-28-01	464
Simes John B.	Nashua	4-23-03	711
Simmons Frank	Hillsboro	7-22-96	571
Simpson Hiram L.	Colebrook	10-23-07	794
Sleeper Ned F.	Lakeport	10- 9-83	302
Small Walter L.	Concord	4-28-97	592
Smith Albert H.	Concord	7- 6-82	281
Smith Amasa D.	Manchester	9-28-80	
Smith Charles H.	Pennington	10-23-07	799



Smith Dante	Manchester	4-24-95	551
Smith Edward C.	Manchester	4-24-89	411
Smith Henry P.	Bethlehem	4-28-81	261
Smith Irving W.	Concord	3-18-85	336
Smith Newton W.	Nashua	10-27-09	822
Snell Timothy H.	Concord	4-27-10	832
Soule G. Fred	Manchester	10-23-89	421
Spence Frank C.	Manchester	1-24-06	761
Spillane George F.	Nashua	1- 7-02	689
Spofford A. S.	Newport	1- 1-10	Rec.
Spofford Charles B.	Claremont	1-24-84	
Sternbloom Albert N.	Keene	4-28-97	594
Stickney Dean R.	Woodsville	4-24-07	785
Stickney Walter H.	Epping	1875	
Stimson Alfred B.	New London	4-25-94	536
Stone George C.	Plymouth	10-26-04	731
St. Onge Arthur	Nashua	7-22-96	570
Storey James H.	Laconia	4-19-80	
Sullivan Daniel A.	Concord	7-26-05	747
Sullivan Daniel W.	Concord	1-14-10	826
Sullivan Eugene	Concord	7-24-88	395
Sweeney Patrick A.	Concord	10-28-96	574
Taylor C. William Jr.	Portsmouth	7-28-97	601
Taylor Herbert L.	Portsmouth	7-28-97	602
Trafton Leo B.	Concord	4-22-96	567
Treggett George	Berlin	1-27-97	585
Tufts Arthur G.	Dover	1880	
Tufts Cleon D.	Manchester	1- 9-02	688
Turcotte John H.	Manchester	4-25-06	765
Twitchell Orvis A.	Milan	7-27-97	583
Tyler George G.	Hanover	1- 1-10	Rec.
Underhill William P.	Concord	1875	
Varney Cyrus R.	Dover	4-24-07	787
Varney George E.	Dover	3-29-77	
Varney Thomas E.	Dover	9-26-87	325
Vickery John E.	Dover	4-23-90	433

Vickery William H.	Dover	1875	
Vittum Albert W.	Concord	1-26-93	613
Wallace Austin E.	Nashua	10- 1-75	
Walsh R. Emmett	Manchester	11- 2-92	506
Watson Charles C.	Rochester	4-28-97	598
Weeks Albert J.	Exeter	10-26-98	621
Weeks Bert M.	Penacook	4-22-02	692
Weeks Brackett B.	Manchester	1875	
Wetherell Albert S.	Exeter	9- 1-75	
White John S.	Manchester	1-24-00	648
Wheeler Leon H.	Warner	10-23-07	795
Whiting Carl J.	Raymond	1-28-91	462
Whitman Nelson S.	Nashua	10- 3-76	
Whitney Walter N.	Henniker	7-26-93	519
Whitten Fred L.	Laconia	4-27-92	491
Whitten Harry A.	Concord	1-25-05	734
Whittier John J.	Concord	1-23-84	310
Wiley James S.	Milton	1-24-00	646
Willard Frank H.	Concord	3-18-85	337
Wilder George P.	Concord	7-24-89	423
Wingate Frank H.	Nashua	4- 5-79	243
Winn Frank G.	Claremont	9-25-75	
Woodman Daniel C.	Whitefield	1-30-89	400
Woodman Herbert C.	Dover	4-23-02	694
Woodward Edgar S.	Lancaster	1-24-94	532
York Charles F.	Manchester	1-26-10	827
Young Payton T.	Manchester	7-22-08	807
Zickendrath Henry.	Manchester	7-28-87	381

\*Deceased

# Pharmacy Law of the State of New Hampshire

---

## CHAPTER 135.

### SALE OF DRUGS AND MEDICINE.

SECTION 1. No person shall conduct or keep a shop of any kind in this state for the purpose of retailing drugs, medicines, or such chemicals as are used in compounding medicines, or engage in the business of compounding and putting up prescriptions of physicians and selling medicines, either as proprietor, agent or assistant, without having first obtained a certificate from the commissioners appointed under the provisions of this chapter; but it shall be lawful for any person to sell proprietary medicines, or to be an owner in the stocks in trade in any druggist or apothecary's shop, if he takes no part in conducting or keeping shop.

SECT. 2. There shall be a commission styled the commission of pharmacy and practical chemistry, which shall be composed of three commissioners, appointed by the governor with the advice of the council, each of whom shall hold his office for three years, and until his successor is appointed and qualified. In case a vacancy shall occur at any time from any cause, the governor, with advice of the council, shall fill the vacancy for the unexpired part of the term. The commission as now constituted is continued, subject to the provisions of this chapter.

SECT. 3. The commission shall hold meetings for the examination of applicants for registration, granting of certificates, and the transaction of other necessary business, at least quarterly, and at such time and place as they may see fit.

SECT. 4 They shall examine any person desiring to engage in the business of apothecary and druggist who has had three years' practical experience in a retail drug store and, if found skilled and learned in pharmacy, shall give to him a certificate stating that he is a skilled pharmacist and authorized to engage in the business of apothecary and druggist. The said commission may in its discretion grant certificates of registration, to be known as reciprocity certificates to such persons as shall furnish with their application satisfactory proof that they have been registered by examination in some other state, provided, such other state shall require a degree of competency equal to that required of applicants in this state, and will grant like certificates to pharmacists registered in New Hampshire. No reciprocity certificate shall be granted until the person so applying shall certify his intention of acting under it in this state.

SECT. 5 They shall examine all applicants over eighteen years of age who have served two years under a registered pharmacist, and grant to such as pass satisfactory minor examinations a certificate as "registered assistant." Such certificate shall not entitle the holder to act as manager of a drug store or pharmacy.

SECT. 6. The commissioners shall procure and keep a suitable book at the office of the secretary of state, wherein they shall register the names and places of residence of all persons to whom they shall issue certificates, and the dates thereof, which shall be open to examination of all persons at all reasonable times.

SECT. 7. The commission shall file with the secretary of state, on or before the first day of December in each year, a report to the governor and council upon the condition of pharmacy in the state and containing a record of their acts and proceedings.

SECT. 8. Each applicant for a pharmacist's certificate shall pay to the commission a fee of five dollars, each

applicant for a reciprocity certificate a fee of five dollars, and each applicant for a registered assistant's certificate a fee of two dollars, for the use of the board. Each commissioner shall also receive five dollars per day for actual service for not exceeding twenty-five days annually and all necessary expenses incurred in the discharge of his duty, to be paid from the state treasury.

SECT. 9. All pharmacists lawfully registered are authorized to keep spirituous liquors for compounding their medicines.

SECT. 10. If any person shall engage in the business of retailing and vending, directly or indirectly, drugs, medicines, and chemicals, and in dispensing medicines and compounding physicians' prescriptions, or shall expose for sale any drugs, medicines, or chemicals without being registered as provided by this chapter, or the law heretofore in force, he shall be punished by a fine not exceeding fifty dollars for each week he shall continue the business without being so registered. Every registered pharmacist who desires to continue the business of apothecary and druggist, shall on January 1, 1910, and biennially thereafter re-register. For failure to re-register or incompetency as a pharmacist from any cause the commission may suspend a certificate of registration until the cause is removed.

SECT. 11. The provisions of this chapter shall not be so construed as to apply to physicians compounding and putting up their own prescriptions.

SECT. 12. It shall be the duty of the commissioners to enforce the provisions of this chapter. For actual services and necessary expenses in the performance of this duty, they shall be paid from the state treasury such sums as the governor and council may determine and approve.











STATE OF NEW HAMPSHIRE

Report of Trustees

OF

STATE NORMAL SCHOOLS

1910

---

CONCORD, N. H.:  
IRA C. EVANS CO., PRINTERS,  
1911.

## OFFICERS

---

### BOARD OF TRUSTEES.

His Excellency Henry B. Quinby ;

Henry C. Morrison, Superintendent Public Instruction,  
*ex officio*.

George D. Towne, M. D., Manchester. Term expires February, 1911.

Henry H. Clark, Franconia. Term expires February, 1912.

Charles R. Corning, Concord. Term expires February, 1913.

Benjamin F. Dame, Newmarket. Term expires February, 1914.

James H. Fassett, Nashua. Term expires February, 1915.

### ORGANIZATION.

President, Henry B. Quinby.

Vice-President, Henry H. Clark.

Secretary, Henry C. Morrison.

Auditor, Henry H. Clark.

Principal, Plymouth Normal School, James E. Klock.

Principal, Keene Normal School, Jeremiah M. Rhodes.

## REPORT OF TRUSTEES

---

*To the Honorable Senate and House of Representatives:*

GENTLEMEN,—We have the honor to submit herewith our biennial report as trustees of the state normal schools. The reports of the principals are attached and made a part of this report.

The period of two years covered by the report has been, perhaps, the most active in the history of this board. It has seen the establishment of a new normal school at Keene, and the completion of long delayed and much needed additional facilities for Plymouth, the reorganization of the board and the adoption of new rules, regular monthly meetings in the place of quarterly meetings as hitherto and not least the adjustment of its working methods to the change in the state government incident upon the establishment of the auditor's department.

### ESTABLISHMENT OF THE KEENE NORMAL SCHOOL.

The legislative session of 1909 provided by law for the establishment of a normal school in the city of Keene, attaching the proviso that the Union School District in the said city should first agree to a contract satisfactory to the trustees for the use of the city schools as model and practice schools.

Ten thousand dollars was appropriated for the establishment of the school, that is, for the purchase of buildings, lands, and apparatus; and a joint board consisting of the governor and council and the trustees was empowered to expend the sum for the purposes specified in the act. The joint board was also authorized to receive aid in money, property or other valuable effects.

Twelve thousand dollars for each of the years 1909-1911



was appropriated for the support and maintenance of the school.

The city of Keene deeded to the state for the purposes of the school the Hale estate, so called, at a cost of \$12,000 to the city. This estate is a tract of land on Main Street, comprising something over two acres. The buildings thereon were the Hale mansion house, in a fair state of repair, a stable and carriage house in good repair, and a large greenhouse which was in a state of dilapidation when taken over by the board.

Adjoining the Hale property to the south was a tract much like it in extent and character, known as the Thayer or Pearson property. This piece had on it a large mansion house in excellent repair, a stable, and a small frame cottage, both in good repair. The property was held as an investment and the prospect seemed to be that it would soon become the location of a number of tenement houses,—evidently an undesirable neighbor for the normal school. On the other hand, its acquisition by the state would round out the normal school lot so as to give streets on three sides with an eventual prospect of a street on the fourth side,—an ample and beautiful campus.

After extended negotiations with the city government, conferences with citizens, and a mass meeting of voters, the city acceded to the proposal of the joint board and appropriated \$7,000, which, with \$5,000 appropriated by the board, was used for the purchase of this Pearson property.

The state thus has real property to a value of \$24,000, at a total outlay of \$5,000.

The Hale mansion house was partly remodeled to serve the purposes of a main normal school building, and it answers very fairly for the number of students thus far in attendance, but it is unsuitable as a permanent home for

the school. It is doubtful if it will fill such a purpose, with any degree of comfort, for two years more.

The mansion house on the Pearson property was immediately devoted to the purposes of a principal's residence, which will, no doubt, serve admirably for many years to come.

The structure of the greenhouse was put in good repair in order to save it. Such a building is an essential adjunct to a modern normal school, and so increasingly useful that it will become necessary to erect a similar structure at Plymouth. The heating apparatus in the Keene greenhouse will need extensive repairs to make it usable.

The stable on the Pearson half of the property is unused. That on the Hale lot was loaned to the Keene school board for temporary use as a schoolhouse.

The cottage on the Pearson property is rented to one of the instructors in the school.

#### PRINCIPAL AND TEACHERS.

The trustees selected for principal of the school, Mr. Jeremiah M. Rhodes, a member of the faculty of the State Normal School, at Emporia, Kansas, and they have committed to him largely the task of selecting his faculty and guiding the development of the school. Both Mr. Rhodes and his faculty have so commended themselves to the people of that part of the state that the trustees feel justified in congratulating themselves upon their selection.

#### CONTRACT WITH KEENE SCHOOL DISTRICT.

A contract has been executed between the trustees and the school district, as provided by law, relating to the use of the local public schools for model and practice purposes.

The main features of the contract are as here described.

The trustees are enabled to take over the entire elemen-

tary portion of the city school system, as it may be needed for model and practice purposes.

The contract, management, and direction of such schools as are thus taken over are vested in the trustees.

The Union School District pays a tuition per capita of average attendance equal to the average per capita of the city for the past five years, the same to be increased or diminished according to the increase or decrease in the average per capita cost in the cities of the state.

The board has thus far taken over two school buildings of four rooms each.

#### COST OF ESTABLISHMENT.

The cost of establishing the Keene School, up to date, according to report accepted by joint board December 17, 1910, is as follows:

Appropriations,	\$10,000.00
Paid on Pearson property,	5,164.00
Remodelling and repairing,	2,294.66
Furniture,	1,234.52
Books and apparatus,	435.52
Advertising,	10.50
	<hr/>
	\$9,189.20

Balance unexpended still, December 17, 1910, \$810.80.

There are a few outstanding bills against this account.

#### FUTURE OF THE KEENE SCHOOL.

The trustees and the principal have, so far as possible, looked ahead with the purpose in mind of providing the possibilities for a long continued and systematic development of the property, to the end that the helter-skelter development of Plymouth and of most older institutions may be avoided.

The principal has discussed the problem at length in his report and to it the attention of the reader is invited.

Subsequently to receiving the report of the principal, the joint board authorized the employment of a landscape architect who studied the situation in all its details with the principal and prepared a sketch showing the location of different buildings, as buildings of different types shall come to be needed. The plan foresees the probable growth of the school for many years to come.

The trustees will ask the legislature at the approaching session to provide for a main school building to accommodate one hundred and fifty students, and for a dormitory to accommodate fifty. It would probably be wise at this time to authorize the heating plant, which must be a feature of the completed institution.

#### PLYMOUTH.

There is little to be said with reference to the Plymouth school, which is not fully covered in the principal's report. The school is long established, its problems are relatively old ones and familiar, and the trustees must confine themselves chiefly to an account of the never-ending progressive adjustment to the demands.

#### MODEL SCHOOL BUILDING.

During the fall term, 1910, the new model school building was occupied for the first time. This is a special design, rated as an eight-room building, located diagonally opposite the main building and on a lot adjacent to that of the Plymouth high school. It has been erected by the school district for the use of the normal school and has cost in the vicinity of \$30,000. The building is designed according to plans devised by the principal, with the end of more economical and efficient training in view.

## POWER HOUSE.

The last session of the general court made an appropriation of \$8,000 to be expended by the governor and council for a power house and coal pocket.

For one reason or another, construction was delayed until the past summer, and the time for the beginning of the fall term found the structure so far from complete that the opening of the fall term had to be deferred.

The building is sufficient for the purpose intended, except that a larger coal pocket would be an advantage. It is poorly constructed and the location is unfortunate, both in that the unsightly features are unnecessarily prominent, and in that the location has made the needed extension of the coal pocket impossible.

## BETTER DORMITORY ACCOMMODATIONS NEEDED.

The present dormitory accommodates, in round numbers, one hundred, leaving about fifty either to be provided for outside or to travel to and from their homes daily. The principal has in recent years deemed it best to rent a house large enough to accommodate a considerable number of students. The rent of this house, in addition to the rent of single rooms about town, makes an unreasonable fixed charge upon the dormitory and it ultimately comes back upon the students as a whole, who ought not to have to bear the burden.

The attention of the legislature is therefore called to the proposition that it would be a measure of justice and economy to provide at once for the construction of a suitable brick dormitory to accommodate the overflow from the present building. We think that land and building could be provided for about \$30,000.

Attention is particularly called to the unsuitable character of the present dormitory, which is a frame structure.

It is an ungainly, barn-like building, built throughout of wood and of a flimsy type of construction. We have tried to make it as safe in all respects as we have been able to do, but we cannot assume responsibility for what might happen in a structure of this kind. It ought to be replaced with a modern and suitable building at the earliest possible time.

#### A STATEMENT AND A PROTEST.

This board cannot conclude its report without calling the attention of the general court to a legislative practice which has grown up in recent years and which we feel plainly involves keen injustice to this board and disaster to the schools under our charge.

We refer to the practice of committing the expenditure of certain kinds of appropriations to the governor and council instead of to the trustees.

A certain appropriation is made, for the erection of a power-house we will say, and the governor and council are charged with its expenditure. They are busy men, busy with their own personal concerns and overworked with the mass and variety of state expenditures committed to their immediate oversight. The relative small normal school project is overlooked, postponed, forgotten until toward the close of an administration, and then a poor and unsatisfactory result is the outcome. The public does n't know this fact and therefore the trustees, not unnaturally, are blamed. Soon repairs must be made or defective work replaced; such must be paid for out of an already small appropriation.

The term of governor and council is two years, and then another administration comes into power, shortly in their turn to give place to others. Such a body of men, especially in the face of a bewildering mass of public work suddenly cast upon them cannot be expected to feel the interest in the well-being of a normal school, which the



trustees feel, some of whom have served the state for many years.

Two instances of the unfortunate outcome of legislation of this character must be frankly stated.

The legislature of 1905 appropriated \$12,000 for an addition to the dormitory at Plymouth. The expenditure was placed under the direction of the McLane administration, which, according to custom, deputed the councilor from the district in which Plymouth is located to oversee the work.

The following summer the trustees were confronted with the fact that the work had been grossly defective throughout. The foundations were a farce, the weight of three stories at one point was carried on a truss whose only anchorage was the brick of a kitchen chimney. In short, the building was falling down, and it is unaccountable that it had not fallen down already. The trustees were compelled to use a considerable portion of the appropriation for maintenance, to repair the results of the administration's neglect. If the wing had fallen down during the school year, with results which can be better imagined than told, the trustees would undoubtedly have been compelled to bear the odium and disgrace of the horror, which the public, ignorant of the legislative mind in the matter, would have heaped upon them.

The other case is that of the power-house at Plymouth, erected during the administration just closing.

The last legislature, under urgent representations of the trustees and of the people of Plymouth, made an appropriation of \$8,000 for the erection of a power-house and coal pocket for the Plymouth Normal School. Instead of committing the appropriation to the care of the trustees, as other matters are, the project was intrusted to the governor and council, who also must supervise the laying out of a great system of highways, remodel a state house, establish a new normal school, superintend numerous small projects

similar in character to this normal school undertaking, and transact the extremely important routine business which is always the portion of the executive branch of the government. Not unnaturally the power-house was neglected. Construction which should have begun at once was deferred for more than a year and finally the regular sessions of the school were interrupted to await completion. Not only that, but the board has on its hands an ill located structure, leaky, and in other ways defective, and which will be likely to require constant repair. Finally, it appears that there was not money enough available to put the structure in running order and the trustees were put to the expense of connecting up with the existing steam mains, an expense for which an additional appropriation must be asked.

This board therefore feels justified in asking that all future appropriations of whatsoever description, for which the board must stand responsible before the bar of public opinion, be committed to the board for expenditure. Such a representation is plainly only in accordance with the dictates of justice and fairness, and certainly in accordance with interests which the board is expected to guard.

#### EXPENDITURES.

With the creation of the auditor's department and the payment of bills directly from the state treasury, the need of a treasurer for this board seemed to have ended. Accordingly Hon. George H. Adams, who had been the faithful treasurer of the board for twenty-one years, closed up his books with the end of the fiscal year ending August 31, 1909. His last report is here given.

## REPORT OF TREASURER

---

*To the Trustees of the New Hampshire Normal School:*

GENTLEMEN,—I submit herewith my report as Treasurer for the year ending August 31, 1909.

### RECEIPTS.

Cash in my hands September 1, 1908,	\$3,302.04
“ of state treasurer, for fourteen months, ending August 31, 1909,	29,166.67
“ “ Plymouth School District, balance on contract for year ending July, 1908,	500.00
“ “ Plymouth School District, text-books, etc., 1908,	303.75
“ “ Plymouth School District, text-books, etc., 1909,	328.00
“ “ J. E. Klock, for coal at Normal Hall,	1,500.00
“ “ Alvin Burleigh, for return premiums on cancelled insurance policies,	316.82
	<hr/>
	\$35,417.28

### DISBURSEMENTS.

Paid for salaries,	\$19,644.03
“ “ repairs and improvements,	2,441.28
“ “ books and supplies,	1,542.13
“ “ furnishings and apparatus,	475.60
“ “ water,	177.06
“ “ fuel,	2,691.44
“ “ insurance,	425.00
“ “ advertising and printing,	197.40
“ “ miscellaneous expenses,	1,310.65
Cash in treasurer's hands, August 31, 1909,	6,512.69
	<hr/>
	\$35,417.28

Respectfully submitted,

GEORGE H. ADAMS,

*Treasurer.*

September 6, 1909.

I have examined the foregoing account for the year ending August 31, 1909, and find the same correctly cast and properly vouched.

HENRY H. CLARK,  
*Auditor.*

September 14, 1909.

I have verified the foregoing audit and find a cash balance in the treasurer's hands of sixty-five hundred twelve and 69-100 dollars.

W. B. FELLOWS,  
*State Auditor.*

For reports of expenditure for year 1909-1910, see principal's reports.

#### ESTIMATES FOR 1911-1913.

##### PLYMOUTH.

<i>Maintenance</i> (annually),	\$26,500
--------------------------------	----------

*Emergency:* whatever the balance over available funds, for connecting up boilers may prove to be.

Dormitory and site,	\$30,000
---------------------	----------

##### KEENE.

##### *Maintenance.*

1911-1912,	\$17,000
1912-1913,	19,800

It should be understood that \$2,000 of the estimates for 1911-1912, and \$3,400 of those for 1912-1913, are condi-

tional on an expected growth of this new institution. It is anticipated that the enrollment for the years in question will be substantially as follows:

1911-1912 Normal School,	60
Model schools,	360
1912-1913 Normal School,	75
Model schools,	480

*Construction.*

Main building,	\$45,000
Dormitory,	25,000
Heating plant,	15,000

The figures for new construction are a close approximation. The board will expect to place before the legislature complete building plans and estimates for all new constructions.

By order of the board,

H. C. MORRISON,  
*Secretary.*

## KEENE.

---

*To the Trustees of the New Hampshire Normal Schools:*

GENTLEMEN,—I have the honor to submit to you the first annual report of the Keene Normal School, which report is a statement of the progress already made and a suggestion of possibilities in the growth of the school for the future. While we may point with some pride to the work of the school year just closed, and may claim credit for foundations already partially laid, yet the past is to be regarded primarily as a prophecy of the future and is to be examined largely to the end that the present moment may be profitable to the upbuilding of an institution of merit in our midst.

### THE IDEAL.

With a school,—as with an individual or a community,—an ideal is an absolute necessity for healthful growth and expansion. Without a vision the people perish. Without an ideal, a school fails as a living force in a civilization. We, therefore, make no apology when we give as a part of the practical work of this institution a statement of a somewhat ideal theory as to what a normal school should be.

The field for our work is New Hampshire—this picturesque granite state with her lovely country, romantic stream, picturesque lake, and majestic mountain. Her men are chivalric, her women domestic and her children capable. She has no large cities, no limitless acres of waving grain, no vast mining industries. She has great memories and corresponding pride of ancestry and achievement. She makes progress, and when convinced will strive mightily in a great cause.

The first problem then for consideration is the practical



one of determining just what the public schools of New Hampshire may require at the hands of a normal school. The normal school is to be an inspiration and also a guide, and at the same time an intelligent follower of the people. At Keene we must build upon what has actually been accomplished in the New Hampshire schools and the schools of America; and must also lead the people into a comprehension of better things and to attempt to achieve those things. The first study on this line for the year just past has been to examine somewhat critically and fully the work of the normal schools of America. I have examined the catalogues and other publications of all state normal schools in this country. The one thing which appears rather prominent in the reports throughout is that each school claims to have some primary advantage over all other schools. This, I take it, is the proper attitude of a school as well as an individual—for we never achieve more than is in ourselves; and one of the first requisites for success is a firm belief in our own powers and in our own ideals. We are ambitious to select from these reports and other sources the things which are best and which are at the same time adapted or adaptable to New Hampshire; and to put them into active operation in our own school. One other thing we expect to do: and that is, to lead in at least some one thing,—doing that thing better than any other school does it.

In working out the ideal of the school, it is my idea that the practical should always be emphasized because, as it seems to me, we reach an ideal situation through the things which we ourselves handle and experience,—that is, through realizing the ideal, as well as idealizing the real.

#### ESTABLISHMENT.

The school at Keene is, in a rather large degree, under the necessity of proving itself or establishing for itself a

real place in the community and in the state. Our first great problem is to win the confidence and secure the co-operation of the people of the local community. This is necessary for two reasons; first, because in large measure the support of a school must come from the community in which the school itself is located, and second, because in this particular instance we have an especially close relation to the city of Keene and to its public schools through the fact that the city schools are to become the training schools for the normal. Considerable diplomacy, therefore, is required in order to make the people of the city feel that normal school has no interest, so far as they are concerned, except that of helping to make the community educationally better because of the location of the school in Keene.

One matter of considerable anxiety to us grows out of the fact that in the Keene schools there are very few normal graduates or professionally trained teachers. According to our notions, therefore, the teachers of Keene are practically ineligible to places in the model training schools of the normal. It is to be said, however, to the credit of Keene and the public school teachers of the place that no invidious criticisms of the normal have been made so far as we know; and that the general spirit is one of helpfulness and a confident belief in our mission. As an evidence of the good will and good fellowship of Keene, I cite here the fact that the principal of the normal school has, on invitation, spoken at public functions in the city five different times and that Mr. Kent, a member of the normal school faculty, has likewise spoken on two different occasions in Keene. A further instance of the willingness,—and not only the willingness but desire,—of the Union District to co-operate in every good way with the normal, comes from the fact that the principal of the normal school is a member of a committee appointed by the Union District

to investigate the questions of manual training, looking to the time when that subject shall become a part of the regular work of the Keene schools.

It is also a matter of gratification to the friends of the normal school that many of the citizens of Keene have expressed themselves as delighted with the work which is being organized and developed by the normal. We have sought also to bring the work of the school somewhat to the attention of the citizens of Keene through the public appearance of the model school children in a cantata which is to be a permanent function of the school. The commencement of the year was also fruitful, we think, in great good in the way of establishing a fellowship with the people and the community. Many of the citizens here expressed themselves as highly delighted with the success of the school as shown by the dignity and strength of our commencement exercises. In these and in many other ways we hope to establish ourselves in the confidence and good graces of the local community.

But aside from this we must, of course, make ourselves felt in New Hampshire; and with this in mind the principal of the school has visited nearly every local center, in the southern part of the state especially, and has spoken many times at teachers' meetings and literary functions in the different communities. Other members of the faculty have also rendered great service in this way.

In all this we do not lose sight of the fact that we are to establish and secure a place in the community through what we do rather than by what we say; and much of our knowledge is directed, therefore, in the direction of superior work in the normal school itself, for we appreciate that the highest success of a school comes through the indorsement given it by its students as they go out into the state and into the world.

## GROUNDS.

The city of Keene, assisted by the state, has secured for the use of this school a plot of five acres in the heart of the city, a campus ideally located, fronting on the famous Main Street of this city and touching upon Winchester Street, which is to be a part of the state road now being built in this part of the state. This campus is already liberally supplied with trees and furnishes a splendid foundation for the establishment of a great school. Through the suggestions of a landscape architect consulted during the summer, it has seemed that probably one of the first things needed is to secure a very careful survey of our grounds with the idea of having this survey made a very definite basis upon which to work for the future improvement and beautifying of the place. It is also believed to be wise that a landscape architect be employed by the board to go over the situation carefully and to suggest the location of various buildings, the landscape features and general problems of outside development. Not only should a full plan of the normal school plant for the entire future be developed, so far as such development is possible, but the whole campus should be beautified and perfected with the idea of making this an ideal spot for our school. In this connection I desire also to call the attention of the board to the possible needs of the future in regard to the expansion of our grounds. In connection with each school used for training purposes, there should be, I think, a school yard—provided either by the city of Keene or the state of New Hampshire. The school garden work for the normal school proper will also need to be planned and some spot on the campus suggested for that purpose to be supplemented by the admirable laboratory already on the grounds.

In addition to this there should be, I think, an athletic field provided for the use of the school. My own opinion is

that a normal, more than any other school, should give attention to the educational value of play and games. Every young woman who is to become a teacher in the public schools should have an intelligent and practical notion of games; and there is no better way to get this knowledge than through the actual experience of the playground. The normal school students should be taught the various games of children and should be given instruction as to their value physically, mentally and morally; and also as to the proper relation of the teacher to the play activities of the children. No teacher is ever best fitted to direct the athletic activities of the children who has not herself actually had experience in the games appropriate to childhood.

One other dream of my own for the future of the school is an experimental farm primarily designed to strengthen the work of the department of elementary agriculture and nature study. Such a farm need not be large, but I think there is real need for a place where the actual business of the farm can be practically established through personal experimentation. We are all agreed, I think, that the best possible way to get a knowledge of a thing is to do that thing; and that nature study and elementary agriculture lose largely their force if given as theoretical studies—girls need the actual contact with the soil. I feel that this subject of agriculture is of especial interest to a New Hampshire community because, as I believe, the state is in need of scientific attention to the soil and its possibilities; and because, I think, the state will always be a commonwealth made up of rural communities.

#### BUILDINGS.

There is on the campus at present two residences, two barns, a tenement and a greenhouse. One of the houses—the Hale mansion—is used for the work of the school;



another—the Thayer house—is occupied by the principal of the school; the tenement, facing Appian Way, is at present occupied by Professor Dudley of the normal school faculty. The Hale barn is in part temporarily occupied by the Union District for school purposes; and the greenhouse is used pretty extensively by the teacher of nature study and agriculture in the work of his department; and is also used by the teachers and children of the model training schools.

The effect of a building upon the growth and development of a school is a question often discussed; and while there are differences of opinion in regard to the subject, it is generally conceded that buildings play a very important part in the development of an institution. It is, in this modern day, often thought best to have a thoroughly equipped and modern building erected before there is any attempt made to begin the academic work of the school. It is felt that that is needed in order to establish the confidence of the people and to give assurance of the suitable character of the work which young people are seeking. Competition is so great in that, as in all lines of human activity to-day, that it is felt to be unwise to establish a school on any other basis. On the other hand it is believed that if a beginning can be made in temporary quarters, opportunity will thus be furnished to study more scientifically and carefully the actual conditions so that when buildings are erected there will be less chance for mistakes in their construction than in the former case. The fact is that the Keene school has made its beginning—having held its session in a building not designed certainly, and perhaps not specially well fitted, for school work. Some of the girls who were attending normal schools last year went elsewhere than to Keene because of our lack of building facilities; but I think that those who actually attended the Keene school found little, if any, criticism to offer on what was actually accomplished so far as the limitation may have been the



result of buildings and equipment. The Hale mansion, indeed, has been peculiarly well adapted to the work of small classes,—more so, indeed, than one would dream could be so in a residence.

As to the future of the school, it occurs to me that we should consider the proposition; first, shall any of the buildings now on the normal school campus be considered as permanent; second, if one or more of these buildings are to be thought of as a part of the new plant, just what building or buildings are to be so considered; third, if any of the buildings are to be retained as a part of the future normal school, are they to occupy the places where they now stand or are they to be moved to some other part of the campus. Perhaps as a basis of thought and possible discussion, I might be warranted here in giving my own opinion on the subject,—which opinion is the result of much thought and some very careful investigation.

In regard to the general situation: I believe that the principal's residence should be considered as a fixture and should occupy the ground where it now stands. I am also thoroughly convinced that the greenhouse is an absolutely essential part of the normal school equipment and that the present house will answer our purpose for a series of years at least; although I am inclined to think that when the house needs extensive repairs again, it may be well to consider the feasibility of erecting a steel-glass structure to take its place. The greenhouse, then, I consider a permanent part of the proper working plan of the normal school; but feel that in time, say twelve or fifteen years, this particular structure will give way to one somewhat better fitted for our work, although this serves admirably our present needs—indeed, there are few, if any, schools in the country that are so well equipped as the Keene school in this one particular.

As to all other buildings on the campus, I am inclined to

think that they should be considered as temporary buildings and that the plans for the development of the campus and school should be made on that basis. Of course when I say "temporary," I would like to be understood as believing that both the Hale mansion and the Hale barn may be used for a considerable time, perhaps for several years, before being finally dismantled,—the first as a place for doing a part of the school work, administration, etc., and the second being fitted up,—when vacated by the city school,—as a physical training building.

*New Buildings:* So far as I have been able to convince myself, I believe that this school should look to the ultimate erection of the following buildings:

First, what might, for want of a better term, be styled the main building.

Second, a library building.

Third, a physical training building.

Fourth, a science-arts building.

Fifth, a greenhouse.

Sixth, a power-house.

Seventh, dormitories.

*Main Building:* The main building, as I think, might occupy one of three places on the campus; first, the location of the present Hale mansion; second, a place approximately midway between the Hale residence and the principal's residence but somewhat back of these buildings on the campus; and third, approximately the place now occupied by the greenhouse,—facing Winchester Street but having the Main Street end of the building virtually a second entrance. This building should provide ample accommodations for two hundred and fifty to three hundred students. There should be provisions also, in this building, for an auditorium with a seating capacity sufficient to accommodate the school in its regular and special activities, the first illustrated by the general assembly of the school, and the

second by reference to model school entertainments, commencements, lectures, etc.; rooms for a library and reading purposes, which rooms are to be regarded as temporary only and, therefore, so arranged that when vacated they may be turned readily into departmental quarters; for on this point it is my firm conviction that a school such as ours, should have a building devoted exclusively to library purposes. Furthermore, there should be in the building temporary quarters for manual training, domestic science and related subjects. This should, perhaps, be the first building erected on the campus; and I suggest that an adequate appropriation should be made for the purpose.

*Library:* The library is the universal laboratory of the school and is the most important single equipment of the school. While there is a great deal of talk about the desirability of abolishing all books from the school, yet the practical problem is still, and probably ever will be, how to use books rather than how to get rid of books. At the Keene school we feel so deeply the importance of the subject of books that the management regards it as absolutely necessary to have training in library management and library science. We believe that the young women who are preparing to be teachers must have a very practical and a very extensive knowledge of books, be skilled in the selection of books and critical in the examination and criticism of the same. Furthermore, this laboratory of the school—the library—should be open from early morn until late at night; and this fact alone would suggest the desirability, if not the necessity of having the library in a separate building from the rest of the school. My own thought in this line is that the library should be open, say, at seven o'clock in the morning, and should remain continuously open until eleven o'clock at night. That would mean, of course, that somebody would be in charge during this entire time, and that in turn would mean that some expense would be at-

tached to the maintenance of the library but it would be pre-eminently worth while, as I think.

The location of this building will depend somewhat on the decision reached as to other buildings; and especially as to where the main building shall stand. If the main building should be erected where the greenhouse now is, the ground at present occupied by the Hale mansion would be an ideal spot. I think, for the library, providing the Hale house is ultimately to be moved or dismantled. If the Hale house is to be preserved, the library building should be placed between the Hale house and the Thayer house but farther back from the street than either of them.

*Physical Training Building:* My recommendation concerning the physical training building is that the Hale barn be fitted up for temporary quarters; and that we contemplate using this building for some years for this purpose and that the permanent building be placed approximately in the same location as the temporary one,—the temporary building being moved out when we are ready to put another building in.

It hardly seems necessary to enter upon an argument for a physical training building in connection with a normal school; as it is almost universally admitted that physical education is quite as important as any other branch of education. In the physical training building the girls should be given scientific and expert physical education so far as it relates, first, to themselves; second, to children; and third, to the community in general. My thought is that a girl's own physical strength should be conserved and built up; and that in every case a young woman should leave a normal school physically strengthened—as well as mentally and morally developed; and, furthermore, that the state is remiss in its duty of educating its children if it neglects this important branch of education.

This building would be the proper place also for the

somewhat more formal work in school hygiene,—a subject which it is our purpose to make very much of in the Keene school. The teacher needs much more intelligent, vital and vitalizing knowledge of the problems of the health of children in crowded class rooms and must know how to detect trouble and how to remedy the same; and she cannot be in a position to do this without having had a scientific course on this line.

*Science and Arts Building:* I have in mind putting into this building not only such science work, properly speaking, as may be thought necessary in a normal school, but also such arts work as is more or less directly related thereto. To be specific, I should have taught in this building manual training; household economy (domestic science, domestic arts, housekeeping); elementary agriculture,—so far as it relates to work in the class room; nature study (its indoor phases); the biological and physiological sciences,—so far as they need to be emphasized in our work; geography; and such other subjects as might need a more or less special treatment.

*Greenhouse:* A greenhouse is one of the very important laboratories of a normal school, as it is a convenient and adequate place for that practical development in nature study and geography lines so greatly needed in the public schools. The present building is adequate for our present needs and should be used until we outgrow it, or, until we need something constructed on different lines. There is need, however, of a modern heating plant for this building, in order that the building may be used to its full capacity at all seasons of the year. I suggest that this item be included in the appropriations asked for this season.

*Power-house:* Nothing need be said here except to state that the heating and lighting of all the buildings on the campus should be from a central point, and that, there-



fore, adequate provision should be made for this particular need of the school. The building should, so far as possible, harmonize architecturally with the rest of the buildings, and should be so placed as to be the least conspicuous of the buildings on the campus. Funds for the erection of this building should be provided by the state legislature at the coming session of that body.

*Dormitories:* I confess to some hesitancy in approaching this subject, never having had any personal experience with the dormitory problem. If dormitories are to be established at Keene, I believe that the best location for the buildings is on Appian Way, with a frontage also to the north overlooking the campus. Just now I have the thought, which thought may be modified as the years go by, that a good plan would be to have virtually two dormitories, the connecting portion containing the dining-rooms, parlors, etc. The dormitory should be so constructed as to have no inside rooms (light and fresh air being absolute necessities for health and comfort). My plan would be to have an open court and the dormitories on two sides of the court with the dining-rooms, parlors, etc., on the third side. I think that this plan would also have an advantage in the fact that it would offer us an opportunity to build one dormitory, which would be complete in itself, and at the same time, when the needs were greater, we could build another and still preserve the general harmony of arrangement. The open court could be utilized for flower gardens, walks, etc. Of course I appreciate the fact that there is no need of going into details in this report as all these matters will have to be worked out by a landscape architect and a building architect, but I make this suggestion merely to give some idea of what is in my own mind at present. If deemed feasible, an appropriation should be asked for at this time to cover the cost of erecting a dormitory.



## REPAIRS AND ALTERATIONS.

Attention is called to the following as possible needs for the immediate future:

1. *The Hale Mansion*: If this building is to be used for a series of years for school purposes then the rooms should be repapered or the paper removed and the walls painted or calcimined.

2. *The Principal's Residence*: I recommend that hardwood floors be laid throughout the building; that some of the rooms, at least, be repapered; and that a lavatory be provided on the first floor and a closet in the basement. There is also need of additional "radiation" in two of the rooms of the house.

3. *Tenement*: This building should be painted—unless, indeed, it is to be moved very soon from the campus.

4. *Greenhouse*: The heating plant needs to be repaired, or a new plant installed.

5. *Barn*: My recommendation here is that the barn be "made over" into a physical training building. The building should be so remodeled as to have a central room 40 x 60 used as a gymnasium, and the other rooms fitted up as an office and as a bath and dressing room. The building should be painted and thoroughly renovated.

6. *Campus*: The center of the campus should be used for outdoor sports—especially tennis and basketball, and courts should be made for that purpose.

## FACULTY.

Statistics prove nothing, perhaps, and yet they are constantly brought to our attention to illustrate or elucidate an argument. It has been contended that of all the forces making for the efficiency and effectiveness of a school, the teacher is, by far the most important. Some estimates

put the influence of this force at eighty-five per cent. Whether this gives even approximately the fact, it is nevertheless true that by the efficiency of the teacher is to be determined *in very great measure* the success of the school. I strongly recommend, therefore, that unusual care be exercised in the selection of teachers for this school, beginning with the principal and extending to the assistants in various departments. Very great care should be exercised to see that as few mistakes as possible are made in the selection, for it is far easier to get a teacher than to get rid of her,—even the dismissal of an incompetent instructor may be fraught with dangers that may well make us hesitate to take the necessary step.

The teacher should have, in a marked degree, at least three qualifications: First, she should be scholarly (in all that the word implies) and cultured; second, she should have had such experience as would be recognized as giving her a real standing among teachers of the state,—not that the experience should have covered any considerable number of years nor even that it should have been in positions of great importance,—but that it should have resulted in the teacher actually finding herself—of having gained that poise and gracious fellow-feeling so necessary in dealing with children; and, third—and perhaps most important—she must be progressive. She must have ideals and yet be absolutely practical; that is, she must have the power to realize ideals,—to actually lift the pupil to a somewhat higher plane than he at present occupies, not by teaching any selfishly worldly ideas of education, but rather by training the pupil so that he may live the actual practical life necessary to ennoble and uplift the race.

Another thing of primary importance to the teacher is a constant study of the problem of education. That study

can be made both in the Keene school itself, and also in the schools outside, but cannot be best made in one of these places alone. To be plain about it, every teacher in the normal school should not only teach there, but should also visit often and examine critically and analytically other schools. I recommend, therefore, that we not only encourage but urge visitation, and that within a certain limit and under proper restrictions the expense of such work be met by the state. It would be quite as valuable to us to have one of our teachers spend a day or two in Plymouth, Fitchburg, North Adams, or some other place occasionally as to spend all her time in Keene. The teacher should also attend occasionally summer sessions of other schools. A concrete illustration of this is the fact that two of our teachers have spent the past summer as students in other schools,—Mr. Kent at Cornell and Mr. Dudley at Columbia.

A teacher should also have the saving grace of "good horse sense,"—not visionary in the sense of vagueness and indeterminateness, not practical in the sense of pure worldliness and selfishness, but large-hearted, large-souled,—a believer in the ultimate good, and willing to work out ideals and ideas, but in doing so content to stay close to the earth and to be a part of the real life of the community.

The plan of the Keene school contemplates further that each teacher is to be vitally and practically interested in the children of the schools. In order to approach the ideal of this matter, it is provided that every teacher of the normal school shall do some work with the children of the model training schools. She is required to be a supervisor of her own subject in these schools and as supervisor is asked to take charge regularly of classes in the various grades.

## TRAINING DEPARTMENT.

Special mention is here made of this work because I feel that the practice school is the great laboratory of the teacher's school. The two more or less conflicting questions constantly before the principal of the school are, first, how are we to give really effective and efficient training to the young women preparing themselves to teach in the public schools of the state; and, second, how may we protect the children from the results of incompetency and inexperience on the part of the practice teacher? So far as I now see it, this work requires a principal of high order of merit—a man who can stand in a true relation between community, teacher and pupil. Under him, the most important supervisor is the supervisor of training who, in the Keene schools, ought to be a man. With us the work is somewhat different from the work in most normal schools,—perhaps different from the work of any other normal school in the United States. The city schools are to be our training schools and the supervisor to be the superintendent of the city schools, as well as the supervisor of training.

Under the supervisor of training are the various normal teachers, who are the special supervisors of the subjects which they themselves teach. It is my thought that the special supervisor should have large powers, especially in initiative and in the organization of the work of his department in the practice schools; but his powers should be circumscribed somewhat because of needs of others, and because of the ideas of the supervisor of training and the general plans of the principal of the school.

There should be, also, a supervisor of kindergarten, primary grades, intermediate grades, and grammar grades. These supervisors should have a large grasp of

the school problems and have had extensive and successful experience as practical teachers.

Enough grade teachers of efficiency and experience should be placed in each building to make effective the work at hand. This is to be determined in part by the supervising officers, assisted by the principal of the normal school.

Just so far as consistent with the needs of the school, trained graduates of the normal are to be put in as temporary teachers in the schools, my idea being to organize a sort of cadet system whereby the most promising graduates of the school may be given one or more years of training with the idea of sending them into the best schools of New Hampshire,—best in the sense of organization, financial remuneration, and so on.

#### FINANCIAL REPORT.

The financial report herewith submitted gives a concrete and accurate statement of the receipts and expenditures of the school from the time of its organization to September 1, 1910. The effort of the management is to exercise rigid economy, even frugality, in the expenditure of funds, but keeping in mind the fact that growth and expansion are absolutely necessary.

SUMMARIES FROM JULY 1, 1909, TO AUGUST 31, 1910.

#### RESOURCES.

Establishment,	\$5,000.00
Maintenance,	12,000.00
Fees,	182.00
Rent,	150.00
Union School District,	1,950.93
	—————\$19,282.93

## EXPENDITURES.

	Normal.	Model.	Total.
Advertising.	\$42.10		\$42.10
Athletics.	1.50		1.50
Books.	679.71	\$232.32	912.03
Commencement.	182.89		182.89
Entertainments.	17.04		17.04
Expense.	368.88	100.95	469.83
Expressage.	28.70		28.70
Freight.	11.10		11.10
Furniture.	1,329.79	124.30	1,454.09
Grounds.	160.62		160.62
Heating and Light- ing.	775.27	379.69	1,154.96
Janitor (miscellane- ous labor).	16.35		16.35
Jobbing.	18.83		18.83
Laundry.	9.90		9.90
Magazines.	43.75		43.75
Pay-roll.	7,730.65	2,689.00	10,419.65
Postage.	165.99		165.99
Printing.	52.48		52.48
Repairs.	2,300.84	4.25	2,305.09
Supplies.	577.03	315.17	892.20
Telephone and tele- graph.	52.92	18.95	71.87
Water.	41.16		41.16
	<hr/> \$14,607.50	<hr/> \$3,864.63	<hr/> \$18,472.13
			<hr/> \$18,472.13
			<hr/> \$810.80



## SUMMARY OF BILLS FROM JULY 1, 1909, TO AUGUST 31, 1910.

Alden, F. H., cartage,	\$15.85
Allen, John E., recording deed,	.62
Allyn & Bacon, book,	1.15
American Book Co., books,	44.63
American Express Co., expressage,	25.70
Antrim Reporter, advertising,	1.00
Appleton, D., & Co., books,	40.05
Atkinson, Mentzer & Grover, books,	1.67
Babb, Edward E., & Co., books,	197.37
Barrett, Agnes, paper at commencement,	1.20
Bausch & Lomb Optical Co., supplies,	68.38
Beedle, C. C., rent of piano,	10.00
Beverstock, Oscar D., miscellaneous labor,	16.55
Bird & Son, F. W., supplies,	3.42
Blair, Evelyn, services at commencement,	15.00
Brewer, The Orville, Co., books,	1.80
Bryan, Elmer B., commencement address and ex- penses,	65.74
Buffalo Public Library, book,	.32
Butler, L. P., & Co., plants,	1.49
Carnegie Library, books,	.75
Chamberlain, W. P., & Co., supplies,	1.20
Cheshire Laundry, laundry,	9.90
Claremont Advocate, advertising,	4.50
Cole, Mabel, labor on books,	1.28
Colony & Sons, J. D., advertising,	7.50
Comstock Publishing Co., book,	4.07
Crowell, Thomas Y., & Co., book,	.31
Darling & Co., paper,	.50
Dietrich, John, expenses,	35.10
Dissette, E. J., book-case,	6.00
Doubleday, Page & Co., books,	8.55
Doughty, Henry C., supplies,	3.60

Dunn & Salisbury, furniture,	\$78.00
Dutton, Mae, paper at commencement,	.45
Educational Publishing Co., books,	1.99
Flanagan Co., A., books,	10.75
Flanders & Chadwick, advertising,	2.00
Fuller, A. I., jobbing,	4.00
Giffin Coal Co., coal,	424.23
Ginn & Co., books,	99.56
Goldberger, Herman, magazines,	43.60
Goodnow & Aldrich Co., furniture,	696.60
Hale, W. S., supplies,	175.79
Hammett, J. L. Co., books,	16.62
Heath, D. C. & Co., books,	8.76
Hinds, Noble & Eldredge, book,	.80
Historical Publishing Co., map books,	6.75
Holt & Co., Henry, books,	27.82
Houghton, H. T., cartage,	1.00
Houghton, Mifflin Co., books,	15.59
Howard, O. J., & Co., furniture,	12.00
Howes, Jean P., repairing clock,	2.00
Hunting Co., H. H., books,	218.07
Illinois Heating and Manufacturing Co., window box,	1.60
•Jefferson, Charles E., baccalaureate address,	75.00
Keene, City of, taxes, etc.,	175.24
Keene Gas and Electric Co., gas,	63.02
Keene Water-Works, water,	25.92
Kent, Harry L., supplies,	6.97
Kirk & Sewall, supplies,	1.60
Knot, L. E., Apparatus Co., supplies,	9.07
Lake, H. E., piano,	307.75
Library Bureau, books,	138.23
Lippincott Co., J. B., books,	9.18
Longmans, Green & Co., books,	10.72
Lothrop, Lee & Shepard Co., book,	1.13

Macmillan Co., books,	\$14.22
Merrill Co., Charles E., books,	3.60
Milford Cabinet, advertising,	3.60
Milton Bradley Co., supplies,	413.80
Moffat, Yard & Co., book,	2.15
*Morrison, Henry C., expenses,	8.05
Moulton, H. C., jobbing,	.75
Mumford, A. W., pictures,	9.66
Nelson & Sons, Thomas, encyclopedia,	86.40
New England Telegraph and Telephone Co., telephone,	62.72
New Hampshire Argus and Spectator, advertising,	2.50
Nims, Whitney Co., glass,	1.10
Orange Judd Co., books,	3.75
Palmer Co., book,	.50
Perry Pictures Co., pictures,	5.44
Peterborough Transcript, advertising,	4.22
Public School Publishing Co., books,	1.77
Ramsdell, Alice E., supplies,	9.50
Rand, McNally Co., books,	8.40
Rhodes, Jeremiah M., miscellaneous,	652.82
Rogers, Sarah J., supplies,	2.25
Rossmann, G. M., labor and material on gas,	37.81
Sanborn, Benjamin H., & Co., books,	12.00
Sawyer, W. W., coal,	44.40
Scribner, Charles, & Co., books,	29.13
Seiler, A. G., books,	7.87
Sentinel Printing Co., printing catalogues, etc.,	166.83
Silver, Burdette & Co., books,	3.88
Simmons, Parker P., books,	16.90
Smith Premier Typewriter Co., typewriter and supplies,	94.00
Spalter, W. H., supplies,	65.24
Spencer Hardware Co., coal, etc.,	399.51

---

\* This was paid from the auditor's office.

Spencer, S. M. Co., supplies,	\$16.67
State Department of Public Instruction, printing,	6.13
Stickney, Clarence E., labor and material.	943.67
Storrs & Bement Co., supplies,	3.00
Suffolk Engraving and Electrotyping Co., half-tones,	20.58
Teachers' College, book,	5.30
Thayer & Collins, lumber,	3.00
Tilden, G. H., & Co., supplies,	20.65
University Co-operative Co., books,	3.38
Union School District, coal,	220.68
University of Chicago Press, books,	3.95
Wadsworth, Howland & Co., supplies,	1.44
Webster Co., F. S., supplies,	5.00
White, C. M., labor and material,	1,354.52
Yeates, Alfred E., supplies,	2.73
	<hr/>
	\$8,052.48

PAY-ROLL FROM JULY 1, 1909, TO AUGUST 31, 1910.

Jeremiah M. Rhodes, principal,	*\$2,916.65
Harry L. Kent, nature study,	1,400.00
Chester H. C. Dudley, drawing,	1,000.00
Sarah J. Rogers, pedagogy,	1,000.00
Kate F. Puffer, psychology,	1,000.00
Clayton E. Hotchkiss, music,	†91.00
Eunice A. Jones, first grade,	\$156.00
Eva F. Hale, first grade,	132.00
Bertha F. Martin, first grade,	156.00
	<hr/>
	444.00
Lora A. Barnes, second grade,	468.00
Lillian M. Hapgood, third grade,	468.00

\* This amount includes salary for July and August, 1909, \$416.65.

† Fifty-five dollars of this amount was paid through the Union District.

Alice E. Ramsdell, fourth grade,	\$504.00
M. Louise Woodward, secretary,	*528.00
Patrick G. Taafe, janitor,	600.00

---

\$10,419.65

In addition to the above, \$18.20 was paid by Jeremiah M. Rhodes direct to substitutes, which amounts were rendered in his personal bills.

#### ATTENDANCE.

On the opening morning, September 28, 1909, twenty-seven girls enrolled for work in the normal school. Other students enrolled from time to time until at the end of the year the total enrollment was thirty-four. This is a small beginning, but we are encouraged by the sentiment that "great trees from little acorns grow," and by the further reflection that these young women are a good type of the progressive young people of New Hampshire,—intelligent, capable, ambitious, industrious. Of the students entering during the year seven enrolled from Keene, six from Walpole, two from Hancock, four from Marlborough, three from Milford, two from Washington, two from Hinsdale, one from Lisbon, one from Greenfield, one from Chesterfield, one from East Sullivan, one from Warner, one from Charlestown, one from Acworth, and one from West Fremont, Me., all in a radius of eighty-four miles, nearly all of them coming from Cheshire, Sullivan and Hillsborough Counties. According to the report of the commission of the Rockefeller Foundation, a school is supported by the people within a radius of fifty miles of the city in which the school itself is located. If this idea be even an approximately correct one, the Keene school will draw its pupils principally from the southern portion of

---

\* This amount includes salary for August, 1909, \$44.

the state, getting in time, perhaps, a few students from Massachusetts and Vermont. On this latter point, however, it may be said that boundary lines become real barriers, it being far more difficult for a student to attend school in some other state than in the state in which he lives. An attempt is here made to illustrate this thought by putting into graphic form some statistics relative to normal school attendance in New Hampshire and attendance by New Hampshire girls.

#### THE FIELD.

Plymouth Normal, total enrollment for year 1908-1909,	171
Number of New Hampshire girls enrolled,	158
Vermont, 6; Massachusetts, 3; Maine, 2;	
Connecticut, 1; Quebec, 1; total,	13
Plymouth Normal, total enrollment for summer term, 1909,	68
Number of New Hampshire girls enrolled,	49
Vermont, 6; Maine, 2; Massachusetts, 7;	
Rhode Island, 2; Nova Scotia, 1; Province of Quebec, 1; total,	19
Plymouth total enrollment for 1908-1909 (including summer session),	239
Plymouth enrollment from New Hampshire (including summer session),	207
Plymouth enrollment from other states (including summer session),	32
Keene total enrollment for year 1909-1910,	34
Keene, total enrollment from New Hampshire,	33
Maine,	1
Number of New Hampshire girls that in one year attended normal schools in New England outside of New Hampshire,	36



Maine—Gorham, 1909,	2
Fort Kent, 1909,	1
Castine, 1909,	1
Massachusetts—Fitchburg, 1909,	6
Hyannis, 1909,	3
Framingham, 1909,	1
Westfield, 1909,	2
Lowell, 1907,	15
Worcester, 1909,	2
Salem, 1909,	2
Rhode Island—Providence, 1909,	1
Total,	<hr/> 36

The above figures are given for the purpose of calling attention to the actual situation in normal school circles in New Hampshire. A question naturally suggesting itself is this, does this give a real measure of the normal school interest in the state; and, if so, can anything be done and what can be done to increase the interest in this work. To me one of the surprising things in connection with this data,—surprising in view of the fact that I have been repeatedly told that some other condition actually existed,—is that there are not more New Hampshire girls attending normal schools outside of the state than of other girls attending normal schools in the state. This means, then, that the total enrollment of Plymouth and Keene, including the summer school at Plymouth, gives us an accurate statement of the number of New Hampshire girls actually attending a normal school. You will see from the above that there are not yet enough students enrolled in the two schools to provide anything like enough trained teachers for New Hampshire. Therefore, either facilities for attending school must be provided—that is, schools opened nearer the homes of the individuals than now—or special interest in normal schools and their work must be de-

veloped. It is fair to say that people do not attend school, any more than they do anything else, without some motive or reason back of it. They do not attend a normal school unless they themselves, at least, have a feeling that a normal school training would prove to be to them a profitable investment.

The means taken by the Keene school, during the past year, to secure attendance have been, largely, advertising in the papers of New Hampshire, especially in the southwestern part of the state; making public addresses; visiting schools, meeting teachers and pupils, and inspecting the work of the various schools; writing letters, personal and circular, to New Hampshire school teachers and to students and others presumably either interested or likely to become interested in our work. This has resulted, I believe, in a pretty thorough advertising of the school throughout the state and particularly in Cheshire, Sullivan and Hillsborough counties.

The total number of teachers in New Hampshire in grades below the high school during the year 1907, was 2,696; of this number but 500 were normal school graduates and 400 graduates of training schools,—900 in all. I suggest that one of the things needed in New Hampshire is to secure, so far as our work will accomplish that result, the interest and co-operation of superintendents and boards of education in the employment of our graduates. I appreciate, of course, that they will not do this unless they feel it to be their interest to do it,—indeed, they ought not to employ normal school graduates unless they can be convinced that such graduates are more efficient than are other teachers.

It may be possible also to do something in the way of legislation which will tend somewhat to increase the attendance on normal schools; and through that attendance to raise the standard of teaching in the state. I suggest that

it is at least worth considering that we secure legislation requiring that all schools of a certain rank, say those maintaining a regular four years' high school course, be required to employ graduates in the grades below the high school.

#### PUBLICATIONS.

The school needs to become thoroughly known throughout the state; and also be repeatedly brought to the attention of the people. There is also need that the normal school itself do something worth while in the educational progress of the state and that it make some contributions to educational literature. I recommend, therefore, that a quarterly bulletin be issued and that the publication be, as far as possible, something of worth and also of practical concern to the teachers of New Hampshire. One number of this bulletin could be given over to what we ordinarily call the catalogue of the school; another might be given to the reports of the principal and board of trustees; and the other two numbers devoted to outlining and discussing topics of importance to normal schools, and of interest to the teachers of New Hampshire and profitable to the schools of the state. I feel that such a publication might be made of real service to the school and to the schools of the state of New Hampshire. In addition to this circular, announcements should be sent out from time to time, and other forms of effective advertising used.

Respectfully submitted,

JEREMIAH M. RHODES,

*Principal.*

KEENE, N. H., September 1. 1910.

## PLYMOUTH

---

*To the Trustees of the New Hampshire Normal Schools:*

GENTLEMEN,—The following report of the work for the past year at the Plymouth School is respectfully submitted:

The school was in session in all forty-four weeks, fall and spring terms of eighteen weeks each, and the summer term of eight weeks. For the fall and spring terms the enrollment was one hundred seventy-five (175), for the summer term seventy (70), a total of two hundred forty-five (245). Fifty-nine (59) were graduated from the General Course, and thirty-two (32) from the Special, making a total of ninety-one (91). This is the largest enrollment ever shown by the school. The demand for the services of graduates is always greater than the supply. Indeed it should be a source of pride to the people of New Hampshire that through their efforts there is at present a recognition of the necessity for trained teachers. Increased remuneration, more commensurate with the service rendered, and a wise moral and financial support of the state normal schools have put the means and opportunity for professional training within the reach of all. These improvements are raising the standard of the teaching profession, and making it sufficiently attractive to enlist a high grade of service which is supplied to many schools hitherto unprovided with efficient teachers. This step forward will prove of inestimable value to the future citizens of the state. Only by a continuance of such effort, however, can New Hampshire maintain its present educational standard.

## TERMS AND COURSES.

Under the present arrangement the terms are:

Fall—September to January.

Spring—January to June.

Summer—July and August.

The courses offered are the General, the Kindergarten, the Special for experienced teachers, the College, and the Graduate. These are described in the annual catalogue and need no further comment here.

## DEPARTMENTS.

The work of instruction is classified under department heads. The aims and the methods of these departments were explained at some length in the report for 1909 (see page 6), hence repetition here seems unnecessary. Elsewhere in this report, suggestions will be made for adding to and modifying these departments.

## SUMMER TERM.

This institution enjoys the distinction of being the only normal school in New England whose summer work may lead to graduation. That this opportunity is appreciated by the aspiring teachers of the state is shown by the large and growing attendance each year. With the attractive environment and facilities afforded by the school, completion of part or all of a course in summer becomes a pleasure, rather than a task. At our last commencement, diplomas were awarded to eleven students who had thus pursued their studies.

This supplementary branch of the work has been carried on for the past four years with no additional appropriation from the state. In order to accomplish this, however, great economy has been practiced and there has been a forced neglect of other desirable matters. The Summer

term constitutes about one-fifth of the work, and about thirty per cent. of the enrollment for the entire year. For this reason, if that session continues it must be assured of stronger financial support.

#### MODEL SCHOOL.

The model school building erected by the Plymouth School District has been completed and is now occupied under a temporary agreement, pending its final and formal acceptance by the trustees. In commending the district for its public-spirited co-operation with the state for increased school facilities, we can only repeat what we had occasion to say in the report for 1904, following the erection of the Plymouth High School building which relieved the normal school from high school work :

“The people of this community have shown themselves fully alive to the interests of all matters pertaining to education.”

At that time they erected and furnished, at an expense of about \$42,000, one of the best high school buildings in the state, now affording secondary school opportunities to a large section surrounding Plymouth. In this case they have furnished for our use a thoroughly modern, two-story, brick building, well lighted and with the best of heating, ventilating and plumbing systems, and especially constructed for the purpose of a model and training school. Upon each floor is a large assembly room, opening into, and communicating with, six smaller recitation rooms. In this building are places Grades I to VI inclusive. Classes forced upon half time for the past two years now have the benefit of full time work, under improved conditions.

The arrangement of the building has made possible a change in the manner of conducting the work. For recitation and observational purposes, two classes are divided



into two sections each; the observation class of about seventy-five students, is divided into groups of fifteen, who observe separately in different rooms. This plan furnishes a greater number of classes, hence more observation work. For practice teaching, another division is made into still smaller groups, each furnishing a small class for a student. This arrangement offers a greater amount of practice to individuals and removes the confusion resulting from the former plan by which the work of an entire grade was suspended during the practice teaching of a single student.

Under this new system much is expected in the way of increased accomplishment. We cannot feel, however, that the department will bring its full measure of usefulness to the school and state until it can be retained solely as an observation school with the training work done elsewhere. There should be in at least one place in the state a strictly model school, conducted by experts, where the possibilities of our work could be shown to their full advantage, and attention to details and supplying of needs of individual pupils increased. Such a plan cannot be accomplished so long as the model classes are at the same time the classes for practice teaching. Particularly is this true where the district affords no larger school than it does at present. With the increasing size of our graduating classes, by whom the practice teaching is done, this condition is becoming more complicated. It is to be hoped that a contract with a conveniently located system of schools will be authorized affording us facilities for training outside of our present schools. Such an arrangement would at once afford relief to the model school and give to our students an increased amount of practice of a more active and practical kind than we can now offer.

## NORMAL HALL.

It goes without saying that proper dormitory accommodations are essential. As a matter of fact, Normal Hall can furnish lodging for only about one-half the necessary number. Recently a dwelling in the neighborhood has been leased for the sum of \$360 per annum to serve as temporary quarters for about twenty students. The rest have been obliged to room in the village at an added expense of \$1,000 to the school. Judging from the constant increase in applications for admission, the necessity for the permanent accommodation of a larger number of students is inevitable. The only satisfactory solution of the problem appears to be the erection of a new brick building. The nature of the construction of Normal Hall and the consequent danger from fire render it undesirable to make further additions thereto.

It is the policy of the school to offer to the students as great a return, in the way of living, as possible, for the fees charged. When such large sums, as will be seen by reference to the financial statement below, are paid for rent and other unusual expenditures this plan is impossible. It is with such an idea in view that the above and other recommendations are made.

Were a new building erected according to the foregoing recommendation, it should contain a gymnasium and recreation room on the first floor, where the students might exercise, play games, and give entertainments. Owing to the fact that there are no hotels in the town, guest rooms are essential for the numerous visitors at Normal Hall. To obviate the necessity of constant traveling up and down stairs an elevator is desirable, and a lift for baggage, furniture, and other freight is a very evident need. A teachers' parlor, toilet, and bath-room, similar to those in other dormitories, are suggested. Hand bowls in all the bath-

rooms would save a considerable amount on the water bills. An enlarged laundry for student use would relieve the almost impossible congestion of the present contracted quarters. In the serving-room, steam tables and cupboards for keeping the food and the dishes warm are recommended. Broad piazzas on the dormitory building would be in many ways a valuable addition. New furnishings for the parlors and for many of the students' rooms would add to the general comfort and the appearance of Normal Hall. A cold storage room, of about twice the capacity of the present one, and more efficient in the matter of giving a low temperature, is also one of the needs of the hall.

As already indicated, a more conveniently placed gymnasium, large enough to be used for public basket-ball games is a necessity. Additions, including parallel bars, stall bars, ladder, traveling rings and horse, should be made to the apparatus in use at present. In connection with the work of this department a swimming tank and shower baths would be a welcome improvement.

The economic management of the hall is now assisted by the employment of a trained domestic scientist.

The financial statement in brief for the year is as follows:

Total receipts for the year,	\$21,481.67
Expenditures:	
Repairs,	\$818.05
Furnishings,	1,102.06
Rent of rooms,	1,097.25
Water,	255.86
Light,	257.38
Apparatus,	254.70
General running expenses,	16,718.80
	<hr/> 20,504.10
Balance,	<hr/> \$977.57

## ALTERATIONS AND REPAIRS.

The removal of the model school classes from several rooms in the normal school building gave opportunity for the long-needed rearrangement and enlargement of our facilities for the normal school proper.

During the past summer the library has been moved from the second floor to the first, with redoubled space, more nearly adequate for the requirements of the large number of students. Two rooms have been connected by an archway and additional shelf room has been installed. Many new volumes, especially works of reference, have been added. All the books have been arranged according to the decimal system now in general use in public libraries. The making of a card catalogue is progressing as fast as possible.

For the science department a lecture and recitation room, a laboratory, a workroom, and a photographic dark-room have been fitted out on the ground floor. For this purpose the former equipment was removed from the old quarters on the top floor, renovated and replaced, and additional fittings installed. The department is now well equipped with regard to both space and convenience of arrangement. All cloak racks in the first floor corridors, except those required by the remaining model school classes, have been removed. This arrangement affords commodious space for cabinets displaying scientific apparatus and museum specimens.

On the second floor the room formerly occupied by the library is now equipped with slate blackboards and used for the departments of geography and English composition. The students' cloak-room has been divided by a partition, leaving on the north side the toilets and lavatory, and on the south side affording for the principal a convenient

consultation room, connecting with the general office. The cloak-room facilities have been transferred to the southwest corner of the basement where a commodious apartment has been fitted up, with toilet and lavatory.

On the third floor two small recitation rooms, combined by removing a partition, have been converted into a much needed music-room, equipped with slate blackboards.

The former science laboratory has been remodeled for the use of the elocution department, and the old science recitation room is now used for the work in history and literature.

Throughout the entire building new shades have been supplied, the walls and ceilings have been retinted and the woodwork varnished where necessary. The result of this improvement is particularly noticeable in Livermore Hall, the assembly room, which is now attractively decorated in harmonizing tones of light green.

The plumbing of the building has been entirely renovated and put in a sanitary condition. The old, unsanitary latrine closets, with time flushes, in both boys' and girls' toilets, have been replaced by rim-flush bowls and individual hand-flush boxes. The urinals have been reset and properly vented. Additional sinks, of white enamel, with water and waste connections, have been installed in the art room and sloyd room.

The old boiler and engine-room has been converted into a much needed general storeroom, to take the place of the former temporary structure in the south end of the basement. This arrangement leaves the entire basement space free and unincumbered by storage.

On the lot in the rear of Normal Hall a storehouse, with cellar, has been built during the past summer. The building is 16 x 26, 10 feet high, frame construction, sheathed inside. The cellar is 7 feet deep, entirely of concrete,

designed for the storage of vegetables, for which there was formerly no suitable provision at the dormitory. To dispose of surface water, which, owing to the soil formation, runs into the cellar, a drain was laid across the grounds to connect with the sewer on the street to the north. The contract price of the building was \$450, and with the drain and other extras will not exceed \$500.

#### TUITION.

During the year the principal was instructed to enforce the requirement regarding tuition from graduates who have not taught the required time in the state. Information was secured from every graduate possible and notices of tuition due sent to each delinquent. The response has been very gratifying, even from teachers who had been out of the school for many years. Thus far \$300 in cash has been collected. In some cases satisfactory explanations have been made; in others the students have returned to the state to render service. In only two or three cases has the response been unsatisfactory or withheld altogether.

It is a noteworthy fact that, in spite of the attractive salaries offered by schools in some other states, of the one hundred seventy-six graduates of the past two years one hundred fifty-six are now teaching in New Hampshire.

#### CONDUIT.

For some time it has been evident that the conduit for steam pipes leading to Normal Hall was in bad condition. During the winter the snow, even after heavy storms, has melted completely, showing that the insulation was not retaining the heat. The matter was investigated and referred to a committee. Repairs are now being made.



## POWER-HOUSE.

At the last session of the legislature a resolution was passed, appropriating the sum of \$8,000 to be expended under the direction of the governor and council for a power-house and coal pocket for the central heating and lighting plant. To secure plans within the appropriation, considerable delay was occasioned. Finally, however, plans were accepted and bids called for in the spring of this year. Contracts were let and the work commenced in July. The building was completed in September; but because the steam fitting was delayed until September 27, heat could not be supplied to the various buildings until two weeks after the date set for the opening of the fall term.

The power-house is a low structure, located directly north of the school building; the western portion, or coal pocket, 15 feet deep, has its roof level with the grade of the school grounds; the engine and boiler-rooms occupy the eastern portion with floor grades somewhat below the level of the sloping grade to the east. The total size of the building is 44 feet 8 inches x 47 feet 6 inches; the coal pocket, 16 feet 4 inches x 44 feet 8 inches; the engine-room, 15 feet x 31 feet 2 inches; and boiler-room, 27 feet x 31 feet 2 inches. The construction is of concrete below the grade, and brick above. The roof of the coal pocket is of reinforced concrete, upon which coal carts may drive to dump coal through the holes provided for the purpose. The sloping roof of the engine and boiler rooms is covered with tar and gravel. At the north, and entirely separate from the building, is an 85-foot chimney, built of radical brick: this is not only an ornament to the plant but a means of highly efficient draft for the boilers.

The two boilers have been removed from the basement

of the school building and installed in the new boiler-room, leaving space for the installation of a third boiler should subsequent demands require. This work was done as a part of the builders' contract. The Shepard engine and the electric generators have been installed in the new engine-room, together with the traps and pump of the steam system. For all these improvements no provision was made under the appropriation. The work has been completed by competent steam fitters under the direction of our own engineer. All old material remaining in a suitable condition was used and the new material necessary purchased in the wholesale market.

It was deemed inadvisable to continue the use of the old Sturtevant engine to run the ventilating fan: many repairs would have been necessary, and the installing of the steam and exhaust connections with new apparatus would entail a large expense. These considerations, with the fact that the engine was not economical to run, led to the conclusion that the installing of a motor, supplied from our own generators, thus giving a daily use of the plant, would be good economy. Accordingly, a Western Electric Company "Hawthorne" motor, of 15 horse-power, 230 volts, has been purchased and set up in the room formerly occupied by the engine. The work of setting and connecting was done by our own men.

As a means of communication between the school building and the power-house, a subway, 15 feet x 6 feet, of concrete construction, has been put in, leading from the old boiler-room to the pump-room, at an expense of \$150.

## RECOMMENDATIONS.

Below are enumerated certain changes and extensions which will greatly add to the efficiency of our work.

## ECONOMICS.

*Domestic Science:* In the report for 1909 a recommendation was made for the establishment and maintenance of a department of domestic science. It seems desirable now to repeat that recommendation, with specific suggestions for its adoption.

In the northeast corner of the basement of the school building is a room 24 x 30, made available by the removal of the engineer's shop to another place. This room is exceptionally well lighted and can at small expense be refitted for the purposes of the proposed department. It adjoins the present manual training room, thus affording the additional advantage of concentrating all the industrial branches of the school. The work in domestic science could be supervised by the matron of the dormitory, who is a trained domestic scientist, thereby reducing to a minimum the cost of instruction.

For the study of cooking, it would be necessary to procure kitchen and dining-room equipment, such as is made use of in similar departments in secondary schools and colleges. Conservative estimates place the probable expense for such an addition at not more than \$500. The subsequent cost of maintenance would vary with the amount of time given to each student: but with economics in connection with the dormitory management, as above suggested, this expense could be covered by a very small figure.

The demands made of grade teachers at the present time render it desirable that we thus broaden the preparation of those whom we graduate, so that they may supply to

suburban schools, at least an introduction to domestic science.

*Manual Training:* The manual training department urges that the course of study for the normal students be somewhat changed. Up to this time wood has been used for much of the work and it is a valuable material where both time and equipment are sufficient for satisfactory results, but for students pursuing the general course the amount of time which the program is able to provide for manual training is limited. Owing to the fact that New Hampshire schools have as yet few equipments for bench work, the department feels that the time can be used to better advantage if the wood-work be practically eliminated from the normal course. In its place should be substituted materials suited to schools without an expensive bench and tool equipment. To this end the present work in the various kinds of basketry could be more elaborately carried on; the work in leather might be broadened; book-binding could be introduced; and weaving, which has been begun in a small way in the grades this year, systematically developed. A course in sewing also should be established. After such training the students could be expected to go forth prepared to give some valuable work in economics to schools not yet supplied with a full bench and tool equipment.

*Science Department:* The instructor in charge of the science department has been working with the idea of making agriculture the core or center of correlation for the science and nature study work. A very little reflection will convince any one that agriculture is admirably adapted to this purpose. It is by far the most important human industry, in that it supplies in so large a measure the indispensable requirements for food, clothing and shelter. This is accomplished by the growing of plants and animals,

the plant being the fundamental factor because it is the real and only food-maker for all living things.

Whoever would grow a plant successfully must provide the conditions necessary for its life, and these are: materials out of which to make food, heat, water, air, light, soil and protection against enemies. The every-day problems of agriculture are the supplying of these conditions to growing plants involving the use of the facts and laws which form the subject-matter of the sciences of biology, botany, zoölogy, geology, geography, mathematics, physics, chemistry, and last but not least, economics. Elementary science and nature-study in the schools should furnish the child with concrete experiences which may serve as a foundation for the intelligent comprehension of the facts and laws, in contact with which and in accordance with which, he must live his life.

For material equipment for carrying out the idea briefly indicated above, the school has the natural environment of its location in a country village and as its own possession a small garden and orchard, school grounds with trees, shrubs and flowers, and a moderately well equipped physical and chemical laboratory. The time-honored arrangement of the school year cuts out one of the most important periods for the study of plant growth, viz.: the summer season. Some means of supplying this lack by enabling study to continue during the colder months becomes desirable. The facilities for such a plan furnished by the ordinary laboratory of the schoolroom are very meager. A special plant laboratory in the form of a greenhouse is almost indispensable for the specific purposes of studying the methods of the propagation of plants, the effects of different temperatures, degrees of moisture, degrees of light, varieties of soil, kinds of fertilizer, and also for the propagation of plants for decorative purposes in the schoolrooms and out of doors.



We would recommend the building of a greenhouse of at least 50 x 20 feet area, divided into compartments so that different temperatures may be used, and provided in part with benches and in part with ground beds.

To repeat a part of last year's report: "For the further improvement of the school grounds, the following suggestions are made: That a border of shrubs and hardy perennials be planted along the west side of the Normal School building; that a row of roses and other shrubs be planted along Court Street, from the west corner as far as the south walk and also along the west side of the latter; that shrubs, including elder, sumac, witch hazel, dogwood, etc., be planted along the north side of the playground next to the Sargent estate; that evergreens and shrubs be planted on the slope east of the playground." Although some of these improvements have been carried out, more funds are necessary to complete these desirable additions.

*Entrance Requirements:* It has always been the aim of the school not to duplicate the work of the schools of the state from which we receive out students. Our course of study should be entirely professional, but attention to academic subjects robs us of time rightfully belonging to other work. The subjects of physics, physiology and chemistry are decidedly essential to the preparation of the grade teacher, particularly in an agricultural and manufacturing state. Their bearing in the correlation of subjects in our science department, as outlined above, is particular evidence of their need. Yet in spite of the fact that these courses are offered by the secondary schools of the state, we find among out students about two-fifths of the high school graduates unprepared in physics, and three-fifths in chemistry. It would seem that now is a proper time to make these subjects a part of the required courses of those who plan to enter on high school and academy certificates of graduation.



## FINANCIAL STATEMENT, 1909-1910.

Received from state appropriation,	\$25,030.00
------------------------------------	-------------

Expended, maintenance and operation:	
--------------------------------------	--

Coal,	\$2,062.17	
Water,	69.00	
School books,	347.41	
School supplies,	220.50	
Telephone and telegraph,	61.09	
Postage,	32.24	
Printing and stationery,	131.97	
Repairs (labor and materials),	260.15	
Freight,	925.58	
Express and cartage,	277.01	
Electric and engine supplies,	405.07	
Furniture and fittings,	147.95	
Sundries,	60.26	
	—————	\$5,000.00

Incidentals:	
--------------	--

Traveling expenses, principal,	\$168.84	
Lectures and entertainment,	150.00	
Books and library supplies,	9.75	
Printing and stationery,	127.16	
Repairs (labor and materials),	66.32	
Freight, express and cartage,	228.37	
Labor and service,	17.00	
School supplies,	52.88	
Sundries,	179.68	
	—————	1,000.00

Salaries:	
-----------	--

Teachers and janitors,	19,000.00
------------------------	-----------

Printing:	
-----------	--

Printing,	30.00	
	—————	\$25,030.00

## STATEMENT OF UNEXPENDED BALANCE FROM LAST YEAR.

(Unappropriated Account.)

Balance in hands of treasurer, September 1, 1910, \$6,512.69  
 Received from Plymouth School District for 1909, 1,000.00

---

\$7,512.69

## Expended:

Salaries, summer term,	\$2,436.33	
Coal,	163.91	
Repairs,	202.34	
School books and supplies,	929.88	
Heating and lighting supplies,	229.66	
Water,	83.62	
Printing,	9.00	
Fire escape,	97.02	
Watchman's clock,	118.75	
Treasurer and bond,	45.00	
Incidentals,	83.02	
	<hr/>	4,398.53

---

Balance September 1, 1910, \$3,114.16

## ESTIMATE OF EXPENSE, 1911, 1912.

From a survey of the financial statement above given, it will be seen that our requirements for the past year have exceeded the amount appropriated by the state. The cause of the extra expense is the maintenance of the summer term with a competent faculty and the running of our complete plant for practically the entire calendar year. Omitting certain items of a rather unusual order, there remains a deficit of \$4,000, which was met by the receipt of two months' additional funds from the state treasurer, made possible by the change in the fiscal year, in 1909, from July

1 to September 1. Subsequent appropriations must of necessity make provision for the summer term, if that important session is to be continued.

Additional expense will be entailed by our new contract with the Plymouth School District for the operation of the new model school, with a decrease of about \$2,000 income per annum which was formerly the amount of the tuition and supply account paid us by that district.

Considering these various facts, it is evident that in order to meet our needs, subsequent appropriations should be at least \$5,000 in excess of that for the past year, or \$30,000. In addition, it is to be hoped that the appropriation will be made in a lump sum, rather than for separate accounts; thus making it possible to utilize money left from any account for other urgent and immediate needs.

#### RECAPITULATION.

In brief, our most urgent needs are: a new dormitory with gymnasium, training facilities in another system of schools, domestic science department, greenhouse, additional improvements to grounds, and increased appropriation.

Respectfully submitted,

J. E. KLOCK.

REPORTS  
OF THE TRUSTEES OF THE  
STATE LIBRARY  
AND THE  
STATE LIBRARIAN

FOR THE PERIOD BEGINNING SEPTEMBER 1, 1908,  
AND ENDING AUGUST 31, 1910.

---

VOLUME IX — PART I

---

PRINTED BY IRA C. EVANS CO., CONCORD. \

BOUND BY RUMFORD PRINTING CO , CONCORD.

---

## STATE LIBRARY.

---

### *Trustees.*

WILLIAM D. CHANDLER, Concord, *Chairman.*

Term of office ends November 10, 1911.

WILLIAM F. WHITCHER, Woodsville.

Term of office ends November 13, 1912.

WILLIAM J. STARR, Manchester.

Term of office ends December 8, 1913.

### *Librarian.*

ARTHUR H. CHASE, Concord. Appointed January 1, 1895.





# REPORT OF THE TRUSTEES.

---

CONCORD, N. H., August 31, 1910.

*To His Excellency the Governor:*

In accordance with custom, the trustees of the state library herewith submit their report for the biennial period ending August 31, 1910.

The steady growth and progress in usefulness of the library, both in its law and general information departments, is pleasing to note; 11,610 bound volumes have been added during the past two years, making the total number of bound volumes 133,610. This is in keeping with its past record, and worthy of continued and sustained effort to the end, that its efficiency may in no way be retarded.

The changes in the arrangement of offices, occasioned by the removal of the Superintendent of Public Instruction and the State Board of Agriculture to the state house, have afforded additional facilities for library work, enlarged the accommodations for book room so that space for 75,000 more volumes has been secured, given more commodious offices to the librarian and trustees and better working quarters to the attorneys.

Believing that the standard of the library, its maintenance, and the quality of its library corps should be continued unimpaired, this board earnestly urges the restoration of the appropriation for library uses and maintenance to the basis of at least \$18,000 for the succeeding biennial term, heartily endorsing the recommendations and reasons therefor of the librarian in this regard.

It would be a reflection on our legislature and our state if the splendid reference library which has been built up by painstaking and proficient endeavor during the past fifteen years, should be curtailed and its efficiency impeded for lack of sufficient funds. The state library is efficiently and economically administered, its law department one of the best in the country, and its general reference departments increasing in attractiveness and strength yearly.

We commend highly the work of the library corps, and especially that of the librarian whose judgment and counsel has been invaluable to your board, and under whose able supervision the library has grown to such splendid proportions as to be justly a matter of state pride.

We take pleasure in adopting as part of our report the various recommendations and requests for improvements embodied in his report, herewith submitted, especially endorsing that portion pertaining to legislative reference work.

WILLIAM D. CHANDLER,  
WILLIAM F. WHITCHER,  
WILLIAM F. STARR,

*Trustees.*

# REPORT OF THE LIBRARIAN.

---

OFFICE OF THE STATE LIBRARIAN,

CONCORD, August 31, 1910.

*To the Trustees:*

The librarian presents the following report of the state library for the twenty-four months ending August 31, 1910:

## GROWTH OF THE LIBRARY.

The accessions of bound volumes to the library for the biennial period has been 11,610 volumes. These volumes added to the 122,000 volumes in the library August 31, 1908, makes the total number of bound volumes August 31, 1910, 133,610.

There are still upon the shelves many unbound volumes and incomplete volumes of periodicals. These are all classified and catalogued with the bound volumes and as fast as our resources will permit we are binding them up for permanent preservation.

## CHANGES IN ARRANGEMENT.

The removal of the offices of the Superintendent of Public Instruction and the State Board of Agriculture to the new state house, together with the placing of the portraits of the governors upon the walls in that building, will provide for much needed additional room for the library.

The trustees' room and office of the state librarian will be moved to the office now occupied by the Superintendent of Public Instruction, thus giving enlarged and more quiet and secluded quarters.

The room at present occupied by the trustees and librarian is to be utilized as a digest room for the attorneys. The Century digest and the digests of all the different states, the American and English Encyclopedia and "Cyc," and the English and Canadian digests will be placed upon convenient shelving in this room and small tables will be provided for study. A public automatic telephone booth will be installed and smoking will be permitted. It is thus hoped to make the use of the law library much more convenient.

The cataloguing department will be installed in the rooms left vacant by the State Board of Agriculture and these rooms will become the work rooms of the library. The present card catalogue will be placed therein in convenient form for use. Thus will be removed from the study hall much of the noise and confusion due to the running of typewriters, etc.

The present art gallery will be utilized as occasion requires as a stack room for books. It is estimated that this room will hold about 75,000 volumes, which will provide for the growth of the library for at least fifteen years to come.

These changes seem to provide needed accommodations for the institution for many years and obviates the necessity of an addition to the building in the near future.

#### IMPROVEMENTS AND REPAIRS.

This building has been connected with the telephone exchange in the state house by five stations, thus bringing this department into much closer touch with the other state departments.

A pipe has been laid between this building and the new part of the state house which will be used to connect the state vacuum cleaning plant with this building at such time as the same is installed.

The governor and council turned over to this library a lot of stone taken from the fence on the west side of the state house yard. Under an agreement with the trustees of the Parish House to bear one half the expense, this stone has been used to build a bank wall between our land and that of the Parish House. I recommend that this wall be extended through to Park Street next spring under proper agreements with the adjoining owner.

#### SALE OF STATE PUBLICATIONS.

Up to September, 1909, money from the sale of all state publications and duplicates was added to the appropriation for books and was spent for the growth of the library. By the enactment of laws abolishing standing appropriations in 1909 the library inadvertently lost the advantage of this additional appropriation. Since this law took effect there has been paid into the state treasury from sales the sum of \$385.27 from which the library has received no return.

The law should be so amended that the above sum may be available for the purchase of books and also that all money accruing in future from sales of books may become an appropriation in addition to the regular appropriation for books.

#### APPROPRIATIONS.

The reduction in appropriations for this library made by the last session of the legislature have seriously crippled its usefulness and growth. If the appropriations are to be limited in future to the sixteen thousand dollars appropriated for the years 1909-10 and 1910-11, it will mean not only that the library cannot make progress in its effort to become a large general reference institution but that it will very soon fall back to the position of an



insignificant and inefficient collection of books signally failing to serve the objects for which it is established.

Through persistent work during the past fifteen years the standard of the library has become very high and it has reached the point where there are very few calls upon it that cannot be met. But already the effect of reduced appropriations is felt in some of the general reference departments, and we must soon discontinue any effort to keep these departments up.

During the years that I have been state librarian my observation has led me to believe that the normal annual appropriation for the support of the library in all departments economically and in the line of progress should be \$18,000, divided as follows:

	1911-12.	1912-13.
For salaries,	\$6,440.00	\$6,240.00
books, periodicals and binding,	6,000.00	6,000.00
expenses of building and library,	5,560.00	5,760.00

The increase in amounts for salaries provides for a necessary increase of one in the number of assistants and for some slight increases in salaries of assistants to rectify present discrepancies.

The seeming increase in the amount for books is not in reality an increase, but a restoration of the book fund to the same basis that it was on from 1897 to 1909. The limiting of this appropriation to \$5,000 by the last legislature works injury to the library in three ways, *i. e.*, first, it prevents the buying of needed current publications in many of the reference departments; second, it keeps the library from accepting most opportunities to secure unique copies of books of peculiar value to the library for one reason or another because the fund is so small it must be husbanded; third, it does not allow of binding properly even the current volumes of periodicals coming in to say nothing of the many other books worthy of binding and preserving.

There seems to be no good reason for separating the appropriations for maintenance of building, maintenance of library and expenses of trustees as they are all really maintenance of library. I therefore recommend the combining of these three appropriations into one. The increase therein shown is necessary for economical increase in shelving and for an electric elevator referred to elsewhere in this report.

#### ELEVATOR FOR BUILDING.

For the past fifteen years the library force has been obliged to lug (carry would not express it) up and down stairs between basement and second story large quantities of books. No one who has not had experience can appreciate the labor and inconvenience involved in this. I confidently assert that there is no one thing which the library needs more for the convenient and economical carrying on of its work than an elevator connecting the different floors.

An electric elevator of approved design, so constructed that it can be operated by any of the library force, can be installed at a reasonable figure and its future maintenance will involve only the cost of the electric current to run it. The wellway, now occupied by the iron stairway in the southwest corner of the study-hall, is admirably adapted for its installation.

I recommend that such an elevator be placed in the building.

#### SURPLUS STATE PUBLICATIONS.

There are stored in the basement of the library duplicates of many department reports that never will be called for. These duplicates in a large number of cases reach a total of four hundred to seven hundred copies and occupy much space which is greatly needed for other uses.

During the past four years a constant effort has been made to make as wide a distribution as possible of these surplus publications among libraries and individuals. I am confident that the demand therefor has now been fully satisfied and that it is useless for the state to continue to preserve such a surplus.

A law should be enacted by the coming legislature authorizing the trustees to dispose of these surplus publications as a whole (reserving twenty-five copies for possible future calls) to the highest bidder after a public competition.

#### PUBLIC LIBRARIES.

The change from standing to annual appropriations at the last session of the legislature cut off the appropriation necessary to supply new public libraries in towns not now having libraries with \$100 worth of books upon the establishment of a public library. This works an injustice to the few towns still without libraries as against those who have received the gift from the state.

The towns of Bow, Chatham, Ellsworth, Livermore, Thornton, Wilmot, and Windsor, while not at present having a free public library within their limits, are appropriating annually the sum required by law for library purposes, said sum being held in trust until a library is established.

The towns of Albany, Barrington, Bethlehem, Dorchester, Madbury, Rollinsford, and Roxbury have no free public libraries and have annually voted inexpedient upon the question of establishing a library fund.

Provision should be made in the annual appropriation bill so that in the event of these towns establishing libraries they may receive the same gift of \$100 worth of books that has been accorded to the other towns.

Additional provision should be made for the expenses of the trustees of this library, acting as library commis-

sioners, and the state librarian as their agent, in rendering to the public libraries such aid in the way of library meetings, advice, the loan of books from the state library and such other services as the conditions may require.

This appropriation should be entirely apart from the appropriations for the state library and known as an appropriation for the support and aid of public libraries.

#### LEGISLATIVE REFERENCE WORK.

Many of the state libraries in this country have established separate legislative reference departments under the supervision and control of a special assistant. The aim of these departments is to furnish to members of the legislature full information, including laws of other states, upon questions coming before the legislature.

Such a department, established upon broad lines, with sufficient money available to fully equip it and furnish the necessary assistants, would in my opinion increase the usefulness of this institution to the legislator. However, with the funds at present available, it is not possible to establish such a department as a separate feature of the library.

We therefore wish to emphasize the fact that one of the original objects of the establishment of this library, which has been kept in mind up to the present time, was that it should serve the legislative branch of our state government. We have upon the shelves large collections upon the different subjects of legislative interests. The library force is at the service of each and every legislator in the work of getting at such facts as he wishes to find. Thus the library as a whole is in effect a large legislative reference department and its resources are at the service of all members. If they will only make their wants known they will be carefully attended to and the results will, I believe, justify the assertion that they have been as well served as they could have been by a special department.

## REPAIR OF ROOF.

Ever since the library moved into its present building the roof has been a source of trouble. The advice of several different experts has been obtained and followed, and still the roof continues to leak. It seems probable that a large part of it must be reconstructed before the difficulty is mastered. The matter is so important and involves so large an expenditure that it would seem wise that a board of survey be appointed, consisting of men of experience, to carefully examine into the conditions and make full report of the causes of the leaking and the remedies to be applied.

## ACOUSTICS OF THE COURT-ROOM.

It is gratifying to be able to report that the defects in the acoustic properties of the supreme court-room have been entirely overcome. Under the supervision of Prof. Wallace C. Sabine, of Harvard University, acoustic expert, changes have been made which entirely do away with the reverberation. Great credit is due Professor Sabine for his painstaking work and the interest he took in making the changes a complete success.

## GIFTS TO THE LIBRARY.

While there have been no large gifts to the institution during the past two years, there have been very many gifts of individual publications of value. Their number has been so large that it is not possible to enumerate them in detail. Assurance is hereby given to all those who have shown their interest in this way that the library authorities heartily appreciate their aid. One of the greatest helps in the administration of the library is the support of it and the interest taken in its welfare by persons both within and without the state who have no personal connection with it.

ARTHUR H. CHASE,  
*Librarian.*

# FINANCIAL STATEMENT.

---

1908-1909.

## BUILDING.

Coal and wood,	\$955.82	
Electricity,	406.38	
Gas,	66.99	
Repairs,	517.47	
Salaries—janitors,	1,539.75	
Sundries,	79.80	
Supplies,	79.04	
Supplies—permanent,	1,250.95	
Water rates,	35.00	
	<hr/>	\$4,931.20

## LIBRARY.

Salary of librarian,	\$2,916.67	
Salaries of assistants,	3,042.13	
Binding,	1,422.54	
Books,	4,184.84	
Expenses of trustees,	178.55	
Printing blanks,	128.22	
Printing reports,	723.33	
Periodicals,	539.25	
Express,	168.08	
Supplies,	300.98	
Postage,	200.52	
Telephone,	39.00	
Sundries,	121.64	
Trucking and freight,	56.62	
	<hr/>	14,022.37
		<hr/>
		\$18,953.57



# FINANCIAL STATEMENT.

---

1909-1910.

## BUILDING.

Coal and wood,	\$698.05	
Electricity,	247.73	
Gas,	56.40	
Repairs,	54.48	
Salaries—janitors,	1,822.00	
Sundries,	63.78	
Supplies,	38.80	
Water rates,	22.43	
	<hr/>	\$3,003.67

## LIBRARY.

Salary of librarian,	\$2,450.00	
Salaries of assistants,	3,350.00	
Binding,	339.25	
Books,	4,222.85	
Expenses of trustees,	31.71	
Printing blanks,	6.30	
Printing reports,	118.50	
Periodicals,	394.95	
Express,	141.13	
Supplies,	538.87	
Postage,	276.02	
Telephone,	32.60	
Sundries,	248.21	
Trucking and freight,	116.15	
	<hr/>	12,266.54
		<hr/>
		\$15,270.21













